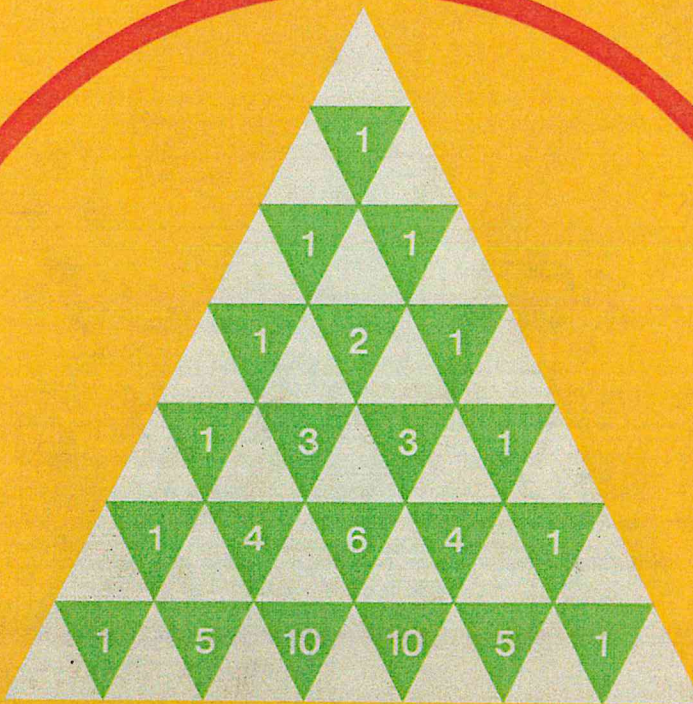
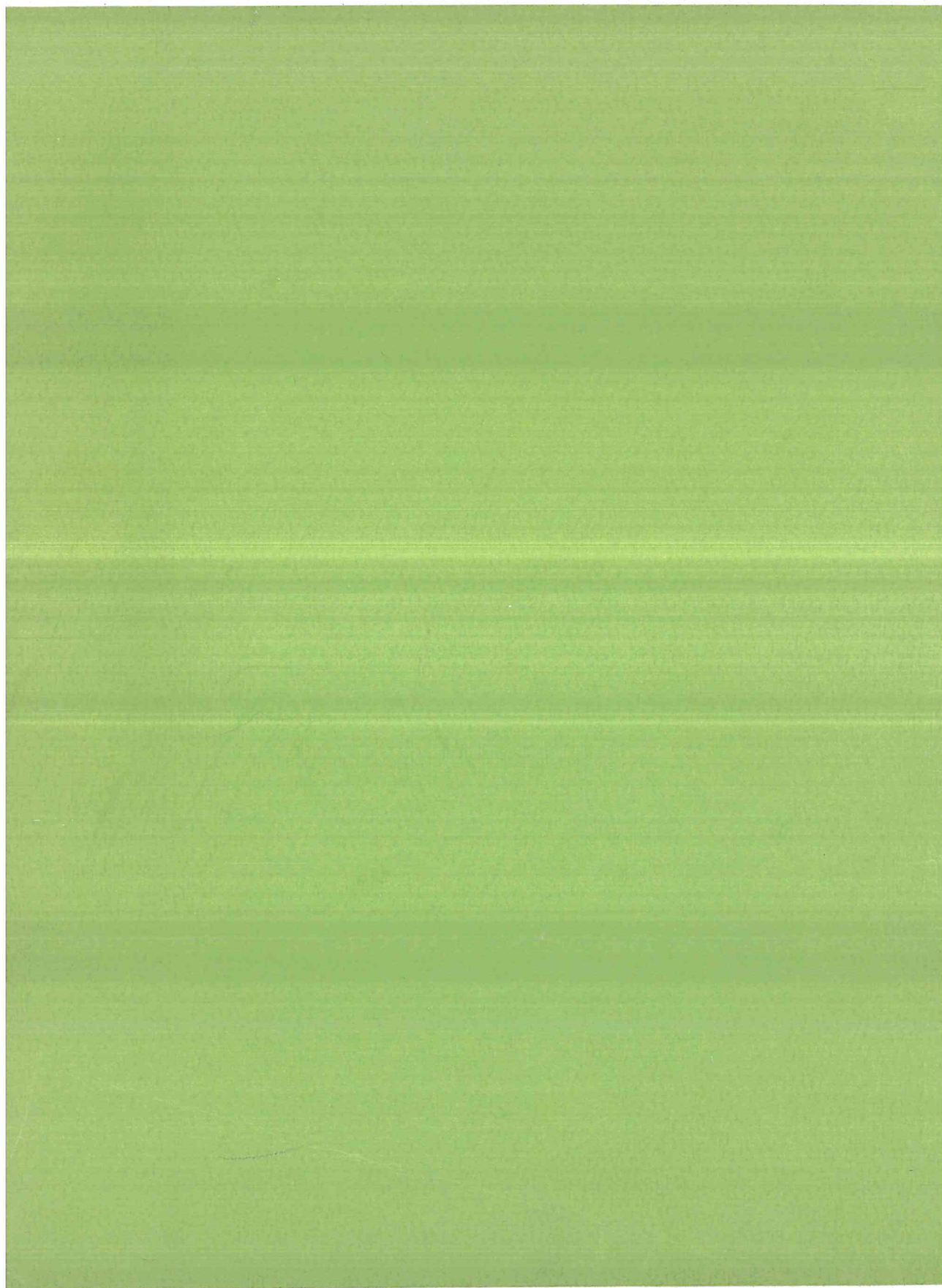


Harbrace Mathematics

GREEN





HARBRACE MATHEMATICS



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SETS AND SUBSETS

A. Set X is the set of pets in the pet show.

■ It can be shown this way.



B. Set Y is a **subset** of set X.

■ It can be shown this way.



C. Set Z is the **empty set**.

■ The empty set has no members.

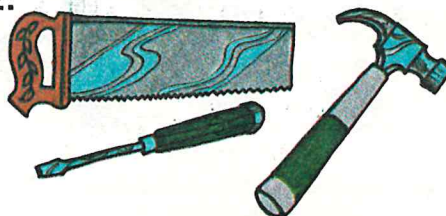


EXERCISES

1.



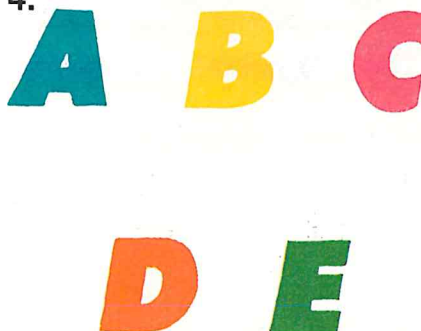
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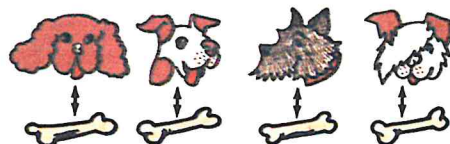
4.



EQUIVALENT AND NONEQUIVALENT SETS

A. Sets E and F match one-to-one.

- They are **equivalent sets**.
- How are equivalent sets alike?



B. Sets E and G do not match one-to-one.

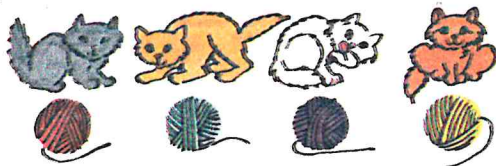
- They are **nonequivalent sets**.
- How are nonequivalent sets different?



EXERCISES

Are the sets in each pair equivalent? Write Yes or No.

*1.



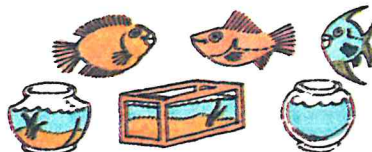
2.



3.



4.



*5.

{A, B, C, D, E}

{F, G, H, I}

6.

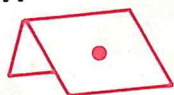
{ , , , ,  }

{ 1, 2, 3, 4, 5 }

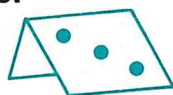
* 1. Yes. 5. No.

There is one dot on the back of the card for each dot on the front.
How many dots are on the back?

*7.



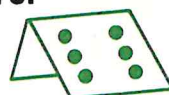
8.



9.



10.



Each row of four stars has been separated into two subsets.
Copy and complete the table below.

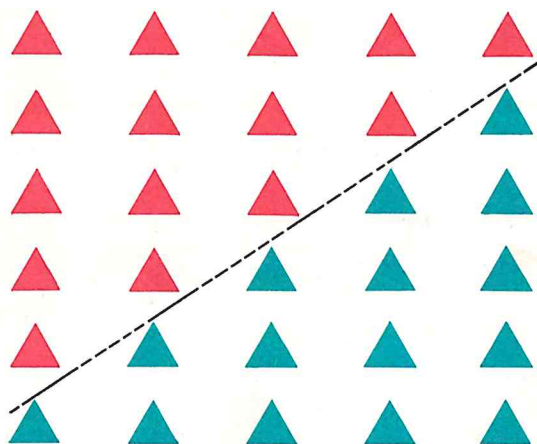
11.

Row A	★	★	★	★
Row B	★	★	★	★
Row C	★	★	★	★
Row D	★	★	★	★
Row E	★	★	★	★

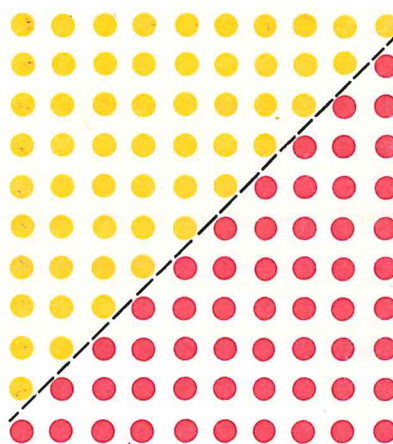
Row	One subset	Other subset
A	4	0
B	3	1
C	2	?
D	?	3
E	?	?

Make a table like the one in Ex. 11 for each picture below.

12.



13.



ORDERING NUMBERS

A. Are there fewer cowboys or fewer horses?

■ 3 **is less than** 4.

$$3 < 4$$



B. Are there more Indians or more teepees?

■ 4 **is greater than** 3.

$$4 > 3$$



C. Is the number of Indians the same as the number of cowboys?

■ 4 **is equal to** 4.

$$4 = 4$$



EXERCISES

Which number is greater?

*1. 8, 5

2. 3, 0

3. 12, 8

4. 15, 17

5. 19, 20

Which number is less?

*6. 4, 3

7. 0, 7

8. 12, 10

9. 18, 16

10. 9, 11

Copy and write *is less than* or *is greater than*.

*11. 5 ? 8

12. 7 ? 6

13. 13 ? 7

14. 15 ? 19

Copy and replace ● with $<$, $=$, or $>$.

*15. 4 ● 7

16. 14 ● 17

17. 15 ● 15

18. 54 ● 57

19. 9 ● 3

20. 19 ● 13

21. 39 ● 33

22. 89 ● 83

* 1. 8

6. 3

11. 5 is less than 8.

15. $4 < 7$

JOINING SETS AND ADDITION

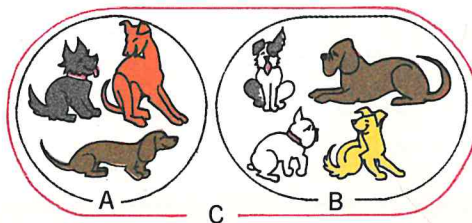
A. The dogs in set A are going to join the dogs in set B.

- How many dogs are there in set A? in set B?



B. The dogs in set A have joined the dogs in set B.

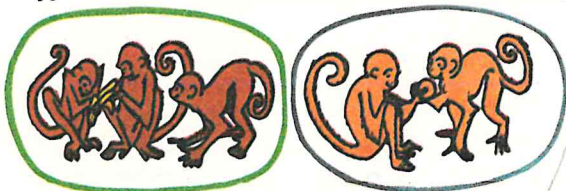
- There are $3 + 4$ dogs in set C.
- The $+$ in $3 + 4$ is read "plus" and means *add*.



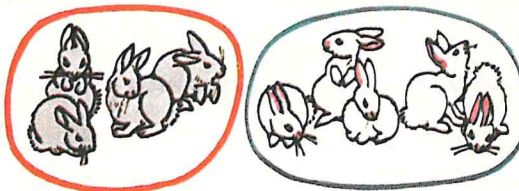
EXERCISES

How many members are in each set? Use $+$ to show how many members there are when the two sets are joined together.

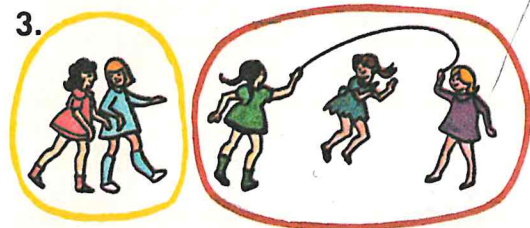
*1.



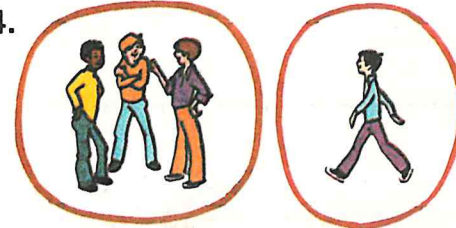
2.



3.



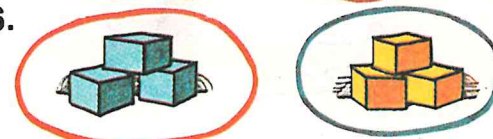
4.



5.



6.



Draw a picture to show the joining of sets for each of these.

7. $4 + 2$

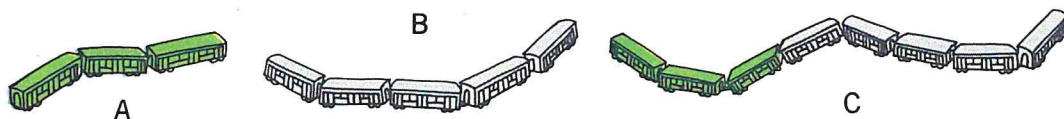
8. $5 + 1$

9. $3 + 6$

10. $4 + 8$

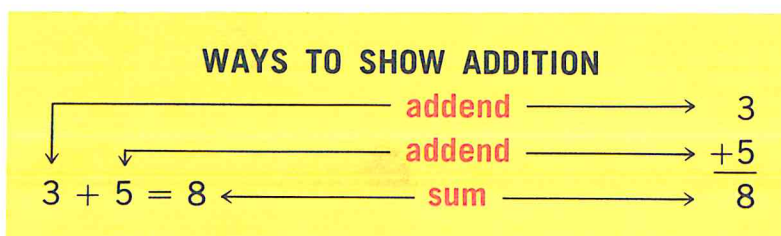
* 1. 3; 2; $3 + 2$

SUMS THROUGH 12



A. How many members are there in set A? set B? set C?

B. In the sentence $3 + 5 = 8$, the symbol $=$ is read “equals” or “is equal to.” It tells you that $3 + 5$ names the same number as 8.



✓ What are the addends and sum in each?

$$4 + 5 = 9$$

$$6 + 5 = 11$$

$$\begin{array}{r} 4 \\ + 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 5 \\ + 7 \\ \hline 12 \end{array}$$

C. How is each boy thinking to name $5 + 7$?



✓ Complete these sentences.

$$2 + 2 = 4, \text{ so } 2 + 3 = \underline{\quad ? \quad}$$

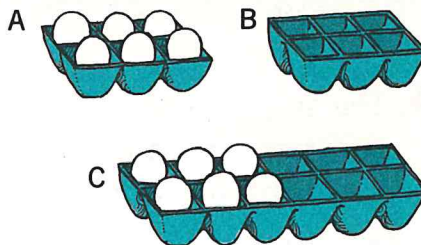
$$4 + 4 = 8, \text{ so } 5 + 4 = \underline{\quad ? \quad}$$

$$3 + 3 = 6, \text{ so } 3 + 4 = \underline{\quad ? \quad}$$

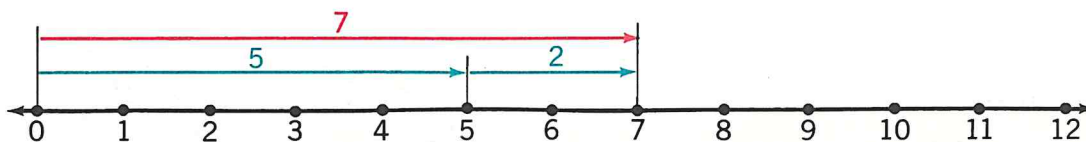
$$5 + 5 = 10, \text{ so } 6 + 5 = \underline{\quad ? \quad}$$

D. How many eggs are there in set A? set B? set C?

■ $6 + 0 = ?$



E. The number line shows $5 + 2 = 7$. Which arrows show the addends? Which arrow shows the sum?



✓ Use the number line to find the answers.

$5 + 4 = \square$

$4 + 5 = \square$

$7 + 3 = \square$

$3 + 7 = \square$

EXERCISES

Find the sum.

*1. $4 + 3 = \square$

2. $3 + 4 = \square$

*3. $\square = 5 + 2$

4. $\square = 8 + 0$

5. $6 + 3 = \square$

6. $\square = 3 + 6$

7. $9 + 1 = \square$

8. $\square = 9 + 2$

9. $9 + 3 = \square$

10. $\square = 7 + 5$

11. $8 + 2 = \square$

12. $5 + 7 = \square$

13. $4 + 6 = \square$

14. $0 + 7 = \square$

15. $\square = 5 + 6$

*16. $\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$

17. $\begin{array}{r} 5 \\ +6 \\ \hline \end{array}$

18. $\begin{array}{r} 2 \\ +9 \\ \hline \end{array}$

19. $\begin{array}{r} 4 \\ +7 \\ \hline \end{array}$

20. $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$

21. $\begin{array}{r} 12 \\ +0 \\ \hline \end{array}$

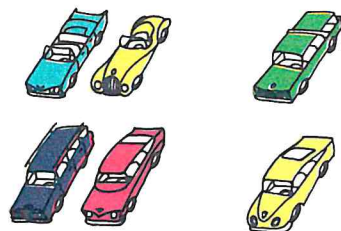
Think Twice

22. Tell what the sum is when you add 0 to any number.

* 1. 7 3. 7 16. 11

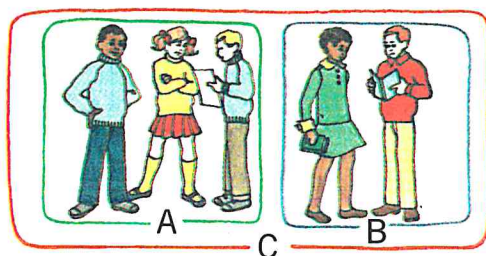
SEPARATING SETS AND SUBTRACTION

- A.** The set of 6 cars has been separated into two subsets. Cover the subset of 4 cars.
- There are $6 - 4$ cars in the other subset.
 - The $-$ in $6 - 4$ is read “minus” and means *subtract*.



- B.** How many children are in set C?
in subset A?
- Which names the number of children in subset B?

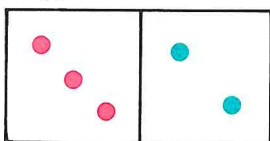
$$5 + 3 \quad 5 - 3$$



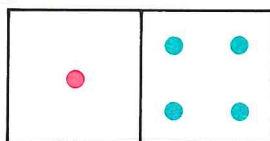
EXERCISES

How many dots are on each card? How many of them are red? Use your answers and the minus sign, $-$, to show how many dots are blue.

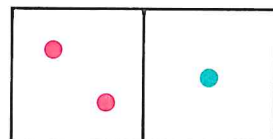
*1.



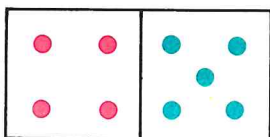
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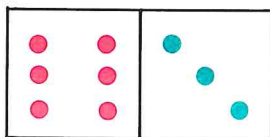
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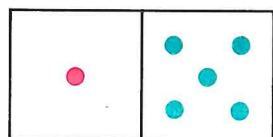
4.



5.



6.



Draw a dot picture to show the sets and subsets for these.

7. $6 - 4$

8. $5 - 3$

9. $8 - 6$

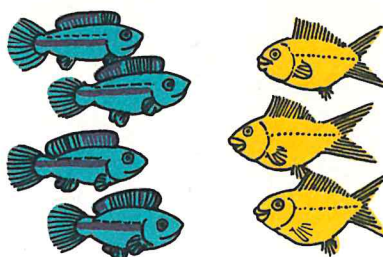
10. $9 - 4$

* 1. 5; 3; $5 - 3$

SUBTRACTION SENTENCES

- A.** How many fish are in the set?
How many fish are blue?

- There are $7 - 4$ gold fish.
There are 3 gold fish.
So, $7 - 4 = 3$.



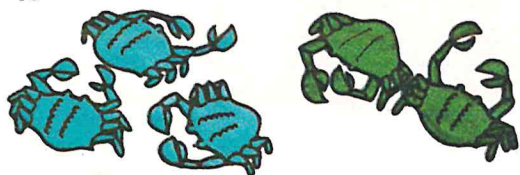
- B.** The number sentence $7 - 4 = 3$ tells you
that $7 - 4$ names the same number as 3.

- What does the number sentence $7 - 3 = 4$ tell you?

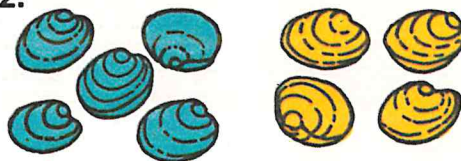
EXERCISES

Write two subtraction sentences for each picture.

*1.



2.



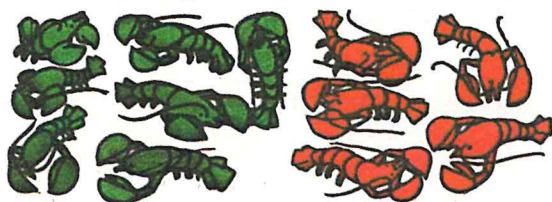
3.



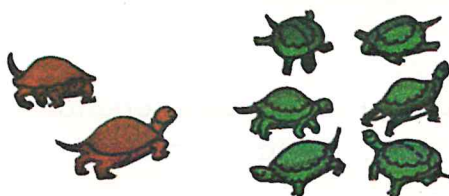
4.



5.



6.



Draw a picture for each pair of sentences.

7. $12 - 8 = 4$; $12 - 4 = 8$

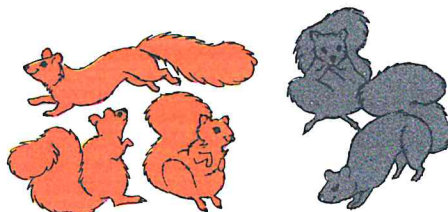
8. $6 - 4 = 2$; $6 - 2 = 4$

*1. $5 - 3 = 2$; $5 - 2 = 3$

ADDITION AND SUBTRACTION

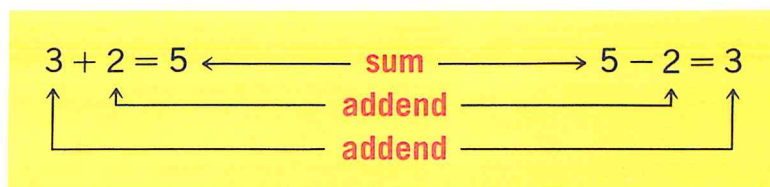
- A.** Use the picture to help you find the answers.

$$\begin{array}{rcl} 3 + 2 & = & \square \\ 2 + 3 & = & \square \end{array} \quad \begin{array}{rcl} 5 - 2 & = & \square \\ 5 - 3 & = & \square \end{array}$$



- B.** The numbers {3, 2, 5} form a **number family**. You can write four true number sentences for a number family.

- What four number sentences can you write for {3, 2, 5}?
- What four number sentences can you write for {6, 2, 8}?



- C.** To find a sum, you add. To find an addend, you subtract.

- Do you add or do you subtract to find the answer?

$$\begin{array}{rcl} 6 + 2 & = & \square \\ 10 - \square & = & 8 \end{array} \quad \begin{array}{rcl} 8 - 2 & = & \square \\ \square - 6 & = & 3 \end{array} \quad \begin{array}{rcl} 7 + \square & = & 9 \\ 10 + \square & = & 12 \end{array} \quad \begin{array}{rcl} \square + 2 & = & 8 \\ 3 + 7 & = & \square \end{array}$$

- D.** Is a sum or is an addend missing in $8 - 5 = \square$?



- Carla remembers, "8 minus 5 is 3. The addend is 3."
- Tom thinks, "5 plus 3 is 8. The addend is 3."
- Marie counts on from 5, "6, 7, 8. The addend is 3."

- ✓ Find the number that makes the sentences in **C** true.

E. Where do you see 10 and 4 at the right?

- Is 10 an addend or is it a sum?
- Is 4 an addend or is it a sum?
- What is the other addend?

**WAYS TO
SHOW SUBTRACTION**

$$10 - 4 = 6$$

$$\begin{array}{r} 10 \\ -4 \\ \hline 6 \end{array}$$

EXERCISES

Write four true number sentences for each.

- | | | |
|----------------|---------------|---------------|
| *1. {1, 9, 10} | 2. {6, 3, 9} | 3. {5, 7, 12} |
| 4. {6, 5, 11} | 5. {2, 8, 10} | 6. {3, 9, 12} |

Write *Sum* or *Addend* to tell what the \square stands for in each sentence.

- | | | |
|-----------------------|-----------------------|------------------------|
| *7. $6 + 2 = \square$ | 8. $5 - 4 = \square$ | 9. $12 - 9 = \square$ |
| 10. $\square + 2 = 6$ | 11. $\square - 4 = 7$ | 12. $3 + \square = 11$ |

Find the answer.

- | | |
|-------------------------------------|------------------------------------|
| *13. $10 - 5 = 5$, so $10 - 4 = ?$ | 14. $12 - 6 = 6$, so $12 - 7 = ?$ |
| 15. $10 - 3 = 7$, so $10 - 7 = ?$ | 16. $11 - 5 = 6$, so $11 - 6 = ?$ |
| 17. $8 + 4 = 12$, so $12 - 4 = ?$ | 18. $9 + 2 = 11$, so $11 - 9 = ?$ |

- | | | |
|------------------------|------------------------|------------------------|
| *19. $9 - 7 = \square$ | 20. $7 - 5 = \square$ | 21. $10 - 7 = \square$ |
| 22. $6 - 0 = \square$ | 23. $10 - 8 = \square$ | 24. $12 - 5 = \square$ |
| 25. $9 + \square = 10$ | 26. $7 + \square = 12$ | 27. $6 + \square = 11$ |
| 28. $\square + 4 = 12$ | 29. $\square + 5 = 8$ | 30. $\square + 6 = 12$ |

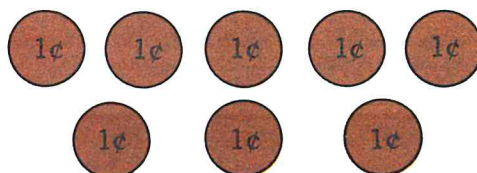
- | | | | | | |
|---|--|---|---|---|--|
| *31. $\begin{array}{r} 6 \\ -4 \\ \hline \end{array}$ | 32. $\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$ | 33. $\begin{array}{r} 11 \\ -7 \\ \hline \end{array}$ | 34. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 35. $\begin{array}{r} 10 \\ -4 \\ \hline \end{array}$ | 36. $\begin{array}{r} 8 \\ -5 \\ \hline \end{array}$ |
|---|--|---|---|---|--|

* 1. $9 + 1 = 10$; $1 + 9 = 10$; $10 - 1 = 9$; $10 - 9 = 1$ 7. Sum. 13. 6 19. 2 31. 2

ADDITION AND SUBTRACTION PROBLEMS

Read each problem carefully. Use the picture to help you answer the questions.

- A.** Marie had 5 pennies.
Her mother gave her 3 more.
How many pennies does she have now?



- Are the two sets being joined or separated?
- Do you add or subtract to find the answer?

- B.** Eric had 5 pennies.
He lost 3 pennies.
How many does he have now?



- Are the two sets being joined or separated?
- Do you add or subtract to find the answer?

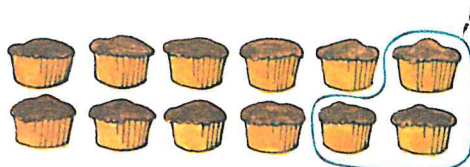
- ✓ Find the answer to this problem.
Seven squirrels are in a tree.
Four are gray squirrels.
The rest are red squirrels.
How many red squirrels are there?



EXERCISES

Use the picture to help you find the answer to each problem.

1. Mother baked 12 cupcakes.
José ate 3 of them.
How many cupcakes are there now?



2. Jody has 7 dolls on one shelf.
She has 4 dolls on another shelf.
How many dolls are on both shelves?



3. Matthew placed 8 cans in a row.
He knocked over 3.
How many are still standing?



Draw a picture to help you find the answer to each problem.

4. Bonnie had 8 pennies.
Then her brother gave her 3.
How many pennies does
Bonnie have now?

5. Neal had 12 pennies.
He spent 5 of the pennies.
How many pennies does Neal
have now?

6. There are 9 puppies in a
pet store. Six are brown
and white. The rest are all
gray. How many gray puppies
are there?

7. Betty has 4 candy bars.
She buys 6 more. How many
candy bars does she have now?

8. There are 5 tall clowns
and 3 short clowns standing
in the ring at the circus.
How many clowns are standing
in the ring?

9. Jim has 12 pencils. Some
are red. He has 7 that are
not red. How many red
pencils does Jim have.

10. Jane has 10 cups on a shelf.
She takes 4 of them to place
on a table. How many cups
are there on the shelf now?

11. Phil has 4 red marbles and
4 blue marbles in a bag. How
many marbles are in the bag?

Think Twice

12. Paul has 3 pears, 2 apples,
and 6 oranges. How many
pieces of fruit does Paul have?

13. Carol had 6 pennies.
Her mother gave her some more.
Then she had less than 11
pennies. How many could her
mother have given her?

NUMBER SENTENCES

A. The set of **whole numbers** is $\{0, 1, 2, 3, 4, 5, 6, 7, 8, \dots\}$.

- The three dots mean the numbers go on in the same way.
- What are the next twelve numbers in this set?

B. *To solve a number sentence means to find the number or numbers that make the sentence true.*

- Suppose \square stands for a whole number.
Why is 2 the answer for $8 - \square = 6$?
Why is 0 one answer for $9 + \square < 11$? Why is 1 the other?

C. *When the same frame is used more than once in a number sentence, it stands for the same number each time.*

- Why is 3 the answer for $\square + \square = 6$?
- Why is 3 not the answer for $\square - \square = 6$?

D. *When different frames are used in a number sentence, they may stand for different numbers.*

They also may stand for the same number.

- Why do the number pairs in each table solve the sentence?

$$\square + \triangle = 3$$

\square	\triangle
0	3
1	2
2	1
3	0

$$\square + \triangle = 4$$

\square	\triangle
0	4
1	3
2	2
3	1
4	0

$$\square + \triangle < 2$$

\square	\triangle
0	0
0	1
1	0

✓ Solve each number sentence.

$$3 + \square = 7$$

$$\square + 5 = 8$$

$$4 = 6 - \square$$

$$\square - 8 = 2$$

$$\square + \square = 8$$

$$5 = \square + \triangle$$

$$\square + \square < 5$$

$$\square + \triangle < 3$$

EXERCISES

Solve each number sentence.

*1. $\square = 10 - 7$

2. $\triangle = 11 - 5$

3. $\triangle = 9 - 5$

*4. $8 + \triangle = 10$

5. $\square + 8 = 12$

6. $12 = 12 + \square$

7. $\square - 8 = 0$

8. $5 = \square - 4$

9. $\triangle - 0 = 7$

10. $\square + \square = 8$

11. $\square + \square = 6$

12. $\square + \square = \square$

Copy and complete each chart to show pairs of numbers that make the number sentence true. Use no whole numbers greater than 12. You should have seven pairs in each chart.

13. $\square + \triangle = 6$

\square	\triangle
0	6
1	5

14. $\square - \triangle = 6$

\square	\triangle
12	6
11	5

Make a chart to show number pairs that make each number sentence true. Use no whole number greater than 12.

15. $\triangle + \square = 4$

16. $5 = \triangle + \square$

17. $\triangle + \square = 11$

18. $3 = \square - \triangle$

19. $4 = \square - \triangle$

20. $5 = \square - \triangle$

Solve. Use no whole numbers greater than 12.

*21. $3 + \square < 6$

22. $\square + 2 < 8$

23. $\square + 7 < 12$

24. $\square + 0 < 8$

25. $\triangle - 0 < 10$

26. $\square - 0 < 1$

27. $5 - \triangle < 2$

28. $7 - \square < 5$

29. $12 - \square < 10$

Think Twice

Solve. Use no whole numbers greater than 12.

30. $\square + \square < 10$

31. $\square + \triangle < 7$

32. $\square - \triangle < 5$

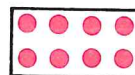
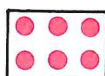
33. $12 - \square < 1$

34. $\square - \triangle < 1$

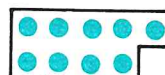
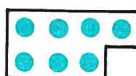
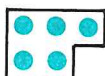
35. $\square - \triangle = 0$

ODD AND EVEN NUMBERS

EVEN



ODD



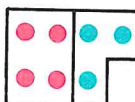
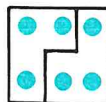
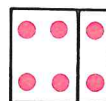
A. Suppose you group a set of beans by twos.

- If there are no beans left over, you have an **even number** of beans.
- If there is a bean left over, you have an **odd number** of beans.
- Name the next 4 numbers in each set.

$\{0, 2, 4, 6, 8, \dots\}$ $\{1, 3, 5, 7, 9, \dots\}$

B. Use the pictures at the right.

- If you add two even numbers, is the sum even or is it odd?
- If you add two odd numbers, is the sum even or is it odd?
- If you add an odd number and an even number, is the sum even or is it odd?



EXERCISES

Will the sum be odd, or will it be even?

*1. $2 + 8 = \square$

2. $3 + 9 = \square$

3. $7 + 5 = \square$

4. $4 + 1 = \square$

*5.
$$\begin{array}{r} 5 \\ +6 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 4 \\ +8 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$$

* 1. Even. 5. Odd.

PENNIES, NICKELS, AND DIMES



1¢



5¢



10¢

A. How many pennies are worth as much as 1 nickel?

How many pennies are worth as much as 1 dime?

How many nickels are worth as much as 1 dime?

B. The symbol for *cents* is ¢.

■ You write 10¢ to show *ten cents*.

What would you write to show *eight cents*?

EXERCISES

How many pennies are worth as much as

- | | |
|-----------------------------|----------------------------|
| *1. 2 nickels? | 2. 1 nickel and 2 pennies? |
| 3. 1 dime and 3 pennies? | 4. 1 dime and 1 nickel? |
| 5. 2 nickels and 4 pennies? | 6. 3 nickels? |
| 7. 1 nickel and 5 pennies? | 8. 1 dime and 5 pennies? |

You have a nickel. How much will you have left

- | | |
|----------------------|----------------------|
| *9. if you spend 3¢? | 10. if you spend 2¢? |
| 11. if you spend 4¢? | 12. if you spend 5¢? |

You have a dime. How much will you have left

- | | |
|-----------------------|-----------------------|
| *13. if you spend 5¢? | 14. if you spend 3¢? |
| 15. if you spend 8¢? | 16. if you spend 10¢? |

Think Twice

You have 15¢. What coins are they, if you have

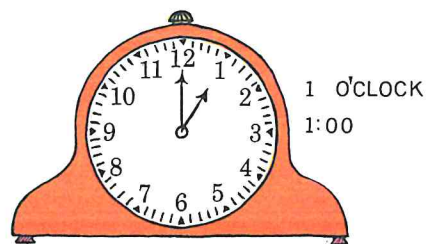
- | | | | |
|--------------|--------------|--------------|--------------|
| 17. 2 coins? | 18. 3 coins? | 19. 6 coins? | 20. 7 coins? |
|--------------|--------------|--------------|--------------|

* 1. 10 9. 2¢ 13. 5¢

TELLING TIME

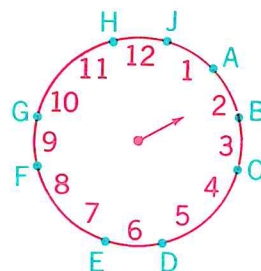
- A.** Where does the short hand point at 1 o'clock? at 8 o'clock?
at 6 o'clock? at 12 o'clock?

■ Where does the long hand point?



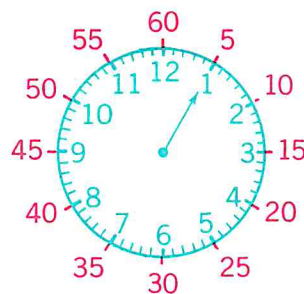
- B.** The short hand shows the hour.
As the short hand moves past 1, it is **after** 1 o'clock or **past** 1 o'clock. It is past or after 1 when the short hand points to A.

■ What hour is it past when the short hand points to the other letters?



- C.** The long hand shows the minutes.
The small marks show the number of minutes. Point to 1 on the clock. How many minutes past the hour is it?

■ Point to each numeral on the clock. How many minutes past?



60 minutes make 1 hour

- D.** At thirty-five minutes past eight you write 8:35 to show the time.
8:35 is read "Eight thirty-five."

■ Do you show the hour or the minutes first?



✓ Read each and tell what it means.

5:12

11:15

3:01

6:59

7:30

9:45

2:13

4:05

EXERCISES

Tell the time for each clock. Then write the time shown on the clock. For example, the first clock shows “ten past nine”; you write 9:10 to show the time.

1.



2.



3.



4.



5.



6.



7.



8.



Write the time for each of the following.

Example: Eight minutes after nine. *Answer:* 9:08

- | | |
|------------------------------------|---------------------|
| 9. Eight minutes after nine. | 10. One o'clock. |
| 11. Twenty-five minutes past five. | 12. Ten forty-five. |
| 13. Forty minutes past six. | 14. Eleven fifty. |
| 15. Twenty-two minutes after four. | 16. Seven ten. |

Think Twice

Write the time for each of the following.

- | | |
|------------------------------------|-----------------------------|
| 17. A quarter of an hour past two. | 18. Half an hour past five. |
| 19. Fifteen minutes before eight. | 20. A quarter till nine. |

CHECKPOINT

✓ Check your understanding of **key terms, phrases, and symbols**.

Use each in a sentence.

set

subset

empty set, { }

equivalent sets

nonequivalent sets

number family

number

whole number

is less than, <

is greater than, >

is equal to, =

even number

plus, +

minus, −

addend

sum

solve

odd number

✓ Check your understanding of **key ideas**.

1a. Are sets A and B equivalent?

$A = \{\star, 0, \square\}$ $B = \{1, 2, 3\}$

1b. How do you know if two sets are equivalent?

2a. What is the number of the empty set?

2b. How do you find the number of a set?

3a. Find the unknown addend.

$8 - \triangle = 3$ $4 + \square = 5$

3b. How do you find an unknown addend when you know a sum and one addend?

4a. Find the sum.

$\triangle = 6 + 0$ $9 + 4 = \square$

4b. How do you find a sum when you know two addends?

✓ Check your **skills**.

Solve each number sentence.

1. $5 + 0 = \triangle$

2. $10 - 2 = \square$

3. $\triangle = 6 + 4$

4. $7 = \square + 5$

5. $9 - 3 < \square$

6. $\square + 4 = 11$

7. $5 + \triangle < 6$

8. $12 - 8 > \square$

9. $6 + 7 > \square$

UNIT TEST

Find the answers.

1. Which number is greater, 23 or 32?
2. Are the two sets equivalent? $\{a, b, c, d\}$ $\{5, 3, 6, 2\}$
3. Sally has 4 red pencils and 4 blue pencils.
How many pencils does she have?
4. Jim had 9¢. He spends 6¢.
How much money does he have left?
5. Write two addition sentences and two subtraction sentences for this number family. $\{5, 3, 8\}$
6. What is the sum in this subtraction sentence?
 $10 - 6 = \square$
7. Find two whole numbers that make this sentence true.
 $\square + 3 < 7$
8. Find two pairs of numbers that make this sentence true.
 $\square + \triangle = 9$

Find the missing addend.

9. $5 + \triangle = 11$

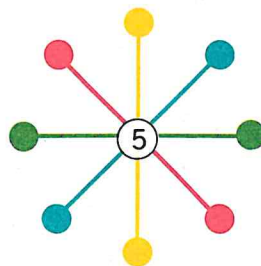
10. $10 - \square = 5$

If you have time, try these.

11. Find the sum of 6, 2, and 5.
12. Find the sum of 5 and 5. Subtract 6 from your answer.

MATHAMUSEMENTS

Copy the diagram. Write 1, 2, 3, 4, 6, 7, 8, and 9 in the rings. The sum of the numbers along each line must be 15. Use each number one time.



INQUIRY INTO NUMBER

An Addition Game

Play the game *Race to Ten* with a friend.
Try to discover how you can always win.

HOW TO PLAY THE GAME

- Two people play the game.
- The first player chooses one of the numbers 1 or 2.
- The second player adds either 1 or 2 to the number chosen by the first player.
- The first player adds either 1 or 2 to the sum.
- The race goes on. The players take turns adding 1 or 2. The person who gets to 10 first wins.

HOW TO WIN THE GAME

Shown below are two games that Susan and Jerry played.

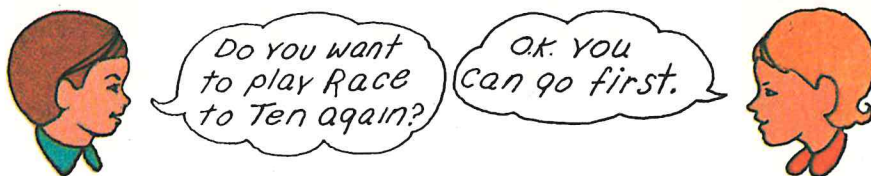
- Who won the first game?
- Who won the second game?
- Who got to 7 first in each game?
- If you get to 7 first, why can you always win?

FIRST GAME

Susan started with $\rightarrow 1$
Jerry added 2 $\rightarrow 3$
Susan added 2 $\rightarrow 5$
Jerry added 1 $\rightarrow 6$
Susan added 1 $\rightarrow 7$
Jerry added 2 $\rightarrow 9$
Susan added 1 $\rightarrow 10$

SECOND GAME

Jerry started with $\rightarrow 1$
Susan added 1 $\rightarrow 2$
Jerry added 2 $\rightarrow 4$
Susan added 1 $\rightarrow 5$
Jerry added 2 $\rightarrow 7$
Susan added 1 $\rightarrow 8$
Jerry added 2 $\rightarrow 10$



Shown below are two more games Susan and Jerry played.

- Who won the first game?
- Who won the second game?
- Who got to 4 first in each game?

FIRST GAME

Jerry started with → 1
 Susan added 2 → 3
 Jerry added 1 → 4
 Susan added 2 → 6
 Jerry added 1 → 7
 Susan added 1 → 8
 Jerry added 2 → 10

SECOND GAME

Susan started with → 2
 Jerry added 2 → 4
 Susan added 1 → 5
 Jerry added 2 → 7
 Susan added 2 → 9
 Jerry added 1 → 10

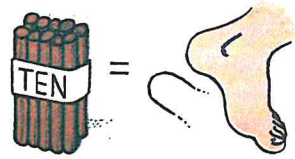
- If you start with 2, can the other player get to 4?
- If you start with 1, can the other player get to 4?
- If you start the game, how can you always win?

For Further Inquiry

- Play the game *Race to Eleven*.
 If you get to 8, can you always win?
 If you get to 5, can you always get to 8?
 If you get to 2, can you get to 5?
 What number should you start with to win?
- Play the game *Race to Thirteen*.
 Find the number to start with to win.
- Play the game *Race to Twelve*.
 To win would you rather go first or second?
- Play *Race to Nine* and *Race to Fifteen*.
 Do you want to go first or second?

EGYPTIAN NUMERALS

- A.** How many fingers do you have?
Long ago in Egypt the numeral for ten was \cap . It is called a *heel bone*. Can you guess why?



- B.** A single *stroke* stands for one.
How many strokes name the same number as \cap ?

$$||||||| = \cap$$

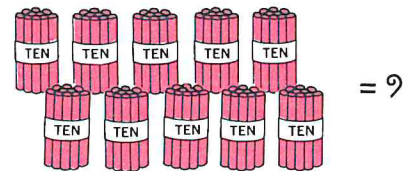
- C.** Read the sentence below as,
“2 heel bones and 3 strokes equals 2 tens plus 3 ones.”

$$\cap\cap |||| = 2 \text{ tens} + 3 \text{ ones}$$

- ✓ Write a sentence like the one above for each.

$$\cap\cap |||| \quad \cap\cap\cap\cap\cap\cap ||||$$

- D.** A *coiled rope* names the same number as 10 heel bones. The numeral for this number is \wp .
How many strokes name the same number as one coiled rope?



$$||||||| = \wp$$

- E.** Two coiled ropes, 3 heel bones, and 4 strokes equals 2 hundreds plus 3 tens plus 4 ones.

$$\wp\wp\cap\cap\cap |||| = 2 \text{ hundreds} + 3 \text{ tens} + 4 \text{ ones}$$

- ✓ Write a sentence like the one above for each.

$$\wp\cap\cap |||| \quad \wp\wp\cap\cap ||||$$

EXERCISES

How many tens are shown?

- *1. $\cap\cap\cap$ 2. $\cap\cap\cap\cap$ 3. $\cap\cap\cap\cap\cap\cap$ 4. $\cap\cap\cap\cap\cap\cap\cap\cap\cap\cap$

Copy and complete each.

5. $\cap\cap\cap\cap = \underline{\quad} \text{ tens} + \underline{\quad} \text{ ones}$
 6. $\cap\cap\cap\cap\cap = \underline{\quad} \text{ tens} + \underline{\quad} \text{ ones}$
 7. $\cap\cap\cap\cap\cap\cap\cap = \underline{\quad} \text{ tens} + \underline{\quad} \text{ ones}$
 8. $\cap\cap\cap\cap\cap\cap\cap\cap = \underline{\quad} \text{ ten} + \underline{\quad} \text{ ones}$

Write the Egyptian numeral for each.

- *9. 3 tens + 2 ones 10. 4 tens + 5 ones 11. 8 tens + 0 ones
 12. 9 tens + 9 ones 13. 1 ten + 8 ones 14. 0 tens + 4 ones
 *15. 3 hundreds + 2 tens 16. 5 hundreds + 4 ones
 17. 1 hundred + 2 tens + 3 ones 18. 4 hundreds + 0 tens + 8 ones

Write each Egyptian numeral using \cap and \mid .

- *19. $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ 20. $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ $\mid\mid\mid\mid$
 $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ $\mid\mid\mid\mid$ $\mid\mid$

Write each Egyptian numeral using ϑ and \cap .

- *21. $\cap\cap\cap\cap\cap\cap$ $\cap\cap\cap\cap\cap\cap$ $\cap\cap\cap\cap\cap\cap$
 22. $\cap\cap\cap\cap\cap\cap$ $\cap\cap\cap\cap\cap\cap$ $\cap\cap\cap\cap\cap\cap$ $\cap\cap\cap\cap\cap\cap$ $\cap\cap\cap$

Write the Egyptian numeral for the number of cents.

- *23. 30¢ 24. 23¢ 25. 100¢ 26. 145¢

Think Twice

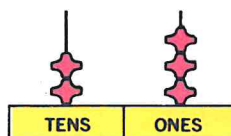
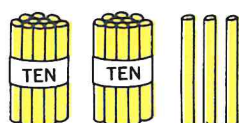
27. Copy and complete this calendar.

SEPTEMBER						
SUN.	MON.	TUES.	WED.	THUR.	FRI.	SAT.
		I	II	III	IIII	IIII
IIII I	IIII II	IIII III	IIII IIII	II	II	II

- * 1. 3 9. $\cap\cap\cap\cap$ 15. $\vartheta\vartheta\vartheta\cap$ 19. $\cap\cap\cap$ 21. $\vartheta\cap\cap\cap\cap\cap$ 23. $\cap\cap\cap$

PLACE-VALUE NUMERALS

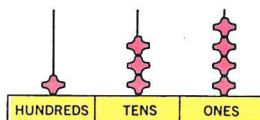
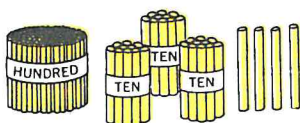
A. How many tens and ones are shown in each?



TENS	ONES	
2	3	23

- How does the Egyptian numeral $\cap\cap\text{||||}$ show 2 tens 3 ones?
- How does the **place-value numeral** 23 show 2 tens 3 ones?

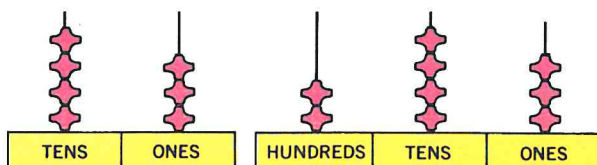
B. How many hundreds, tens, and ones are shown in each?



HUNDREDS	TENS	ONES	
1	3	4	134

✓ Write a place-value numeral for each number.

TENS	ONES	HUNDREDS	TENS	ONES
5	6	3	2	8



EXERCISES

Write a place-value numeral for each number.

*1. $\cap\cap\text{||||}$

2. $\cap\cap\cap$

3. $\text{C}\cap\cap\text{||||}$

4. $\text{C}\text{C}\cap\cap\cap$

*5.

TENS	ONES
4	2

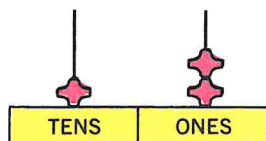
6.

TENS	ONES
5	0

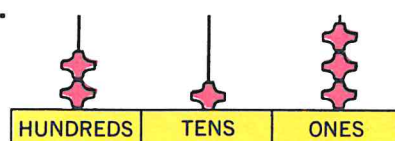
7.

HUNDREDS	TENS	ONES
5	2	4

*8.



9.



* 1. 23 5. 42 8. 12

Make each sentence true.

10. 2 tens + 5 = 25,
so $20 + 5 = \square$

11. 8 tens + 2 = 82,
so $80 + 2 = \square$

*12. $40 + 5 = \square$

13. $10 + 8 = \square$

14. $10 + 4 = \square$

15. $10 + 1 = \square$

16. $30 + 7 = \square$

17. $40 + 6 = \square$

*18. $10 + \square = 12$

19. $80 + \square = 82$

20. $70 + \square = 79$

21. $300 + 10 + 4 = \square$

22. $200 + 80 + 6 = \square$

23. $400 + \square + 8 = 468$

24. $500 + 20 + \square = 527$

25. In 34¢, the 3 shows the number of
and the 4 shows the number of .

26. Eight dimes and 7 pennies make ¢. $80 + 7 = \underline{\hspace{1cm}}$

Copy and replace ● with < or >.

*27. $5 + 5 = \cap$, so $5 + 6 \bullet \cap$, $5 + 8 \bullet \cap$, and $5 + 4 \bullet \cap$.

28. $6 + 4 = \cap$, so $6 + 3 \bullet \cap$, $6 + 5 \bullet \cap$, and $6 + 0 \bullet \cap$.

29. $7 + 3 = \cap$, so $7 + 6 \bullet \cap$, $7 + 7 \bullet \cap$, and $7 + 2 \bullet \cap$.

30. $8 + 2 = \cap$, so $8 + 0 \bullet \cap$, $8 + 1 \bullet \cap$, and $8 + 8 \bullet \cap$.

31. $9 + 1 = \cap$, so $9 + 6 \bullet \cap$, $9 + 0 \bullet \cap$, and $9 + 4 \bullet \cap$.

Think Twice

32. If the symbol \oplus means "Add ten," then $3 \oplus$ means $3 + 10$, or 13. Find the numbers that make these sentences true.

$4 \oplus = \square$

$27 \oplus \oplus = \square$

$56 \oplus \oplus \oplus = \square$

33. If the symbol \ominus means "Subtract ten," then $15 \ominus$ means $15 - 10$, or 5. Name the number that makes each true.

$27 \ominus = \square$

$53 \ominus \ominus = \square$

$62 \ominus \ominus \ominus = \square$

* 12. 45 18. 2 27. $5 + 5 = \cap$, so $5 + 6 > \cap$, $5 + 8 > \cap$ and $5 + 4 < \cap$

ORDERING TENS

- A.** Each whole number from 0 to 9 should be shown *in order* on this number line.



- Which numbers are not shown?
Where should they be shown?

- B.** Each number of tens from 10 to 90 should be shown *in order* on this number line.



- Which numbers are not shown?
Where should they be shown?

- C.** Tell whether $<$, $=$, or $>$ makes each sentence true.

- | | | | | |
|-----------|---------|---------|---------|---------|
| ■ 7 ● 3 | 17 ● 13 | 27 ● 23 | 57 ● 53 | 97 ● 93 |
| ■ 4 ● 6 | 40 ● 60 | 48 ● 68 | 42 ● 62 | 49 ● 69 |
| ■ 5 ● 5 | 35 ● 25 | 15 ● 45 | 65 ● 85 | 75 ● 35 |
| ■ 33 ● 22 | 56 ● 54 | 71 ● 69 | 35 ● 25 | 89 ● 90 |

EXERCISES

Write $<$, $=$, or $>$ to make each sentence true.

- | | | | |
|------------|-------------|-------------|-------------|
| *1. 9 ● 8 | 2. 19 ● 18 | 3. 39 ● 38 | 4. 59 ● 58 |
| 5. 21 ● 21 | 6. 61 ● 41 | 7. 31 ● 11 | 8. 71 ● 81 |
| 9. 17 ● 17 | 10. 41 ● 39 | 11. 46 ● 56 | 12. 79 ● 80 |

Write the numerals so the numbers are in order from least to greatest.

- | | | |
|------------------|------------------|------------------|
| *13. {3, 1, 7} | 14. {5, 0, 9} | 15. {30, 10, 20} |
| 16. {27, 57, 17} | 17. {49, 42, 46} | 18. {51, 38, 49} |

* 1. $>$ 13. {1, 3, 7}

ORDERING HUNDREDS

- A.** Tell how to complete the number line to show the number of hundreds from 100 to 900 in order.



- Count by ones from 1 to 9.
Count by tens from 10 to 90.
Count by hundreds from 100 to 900.
- B.** Tell whether $<$, $=$, or $>$ makes each sentence true.
 - 10 ● 100 90 ● 100 30 ● 100 50 ● 100
 - 100 ● 42 100 ● 58 100 ● 75 100 ● 99
- C.** Tell whether $<$, $=$, or $>$ makes each sentence true.
 - 400 ● 500 320 ● 120 290 ● 490 560 ● 760
 - 310 ● 320 460 ● 430 570 ● 580 220 ● 210
 - 520 ● 480 370 ● 610 930 ● 910 650 ● 640
- D.** Tell whether $<$, $=$, or $>$ makes each sentence true.
 - 321 ● 324 736 ● 732 598 ● 590 116 ● 119
 - 452 ● 432 575 ● 505 397 ● 377 426 ● 466
 - 195 ● 201 387 ● 383 515 ● 615 899 ● 900

EXERCISES

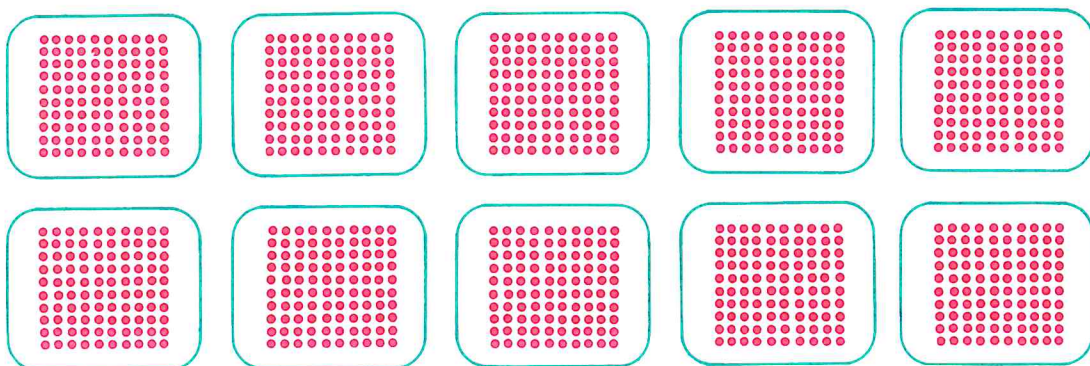
Write $<$, $=$, or $>$ to make each sentence true.

1. 632 ● 633 2. 185 ● 184 3. 757 ● 747 4. 412 ● 422
5. 568 ● 468 6. 789 ● 789 7. 154 ● 254 8. 809 ● 709
9. 298 ● 301 10. 605 ● 599 11. 333 ● 299 12. 968 ● 967

Write the numerals so the numbers are in order from least to greatest.

13. {2, 8, 4} 14. {1, 0, 6} 15. {70, 40, 10}
16. {36, 86, 26} 17. {39, 31, 35} 18. {42, 15, 27}

THOUSANDS



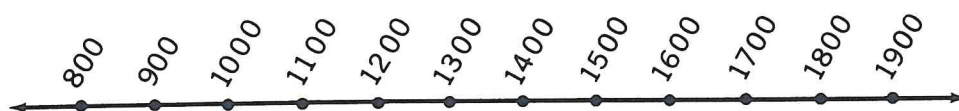
A. There are one hundred dots in each set.

- Count the dots by hundreds.

Begin: One hundred, two hundred, three hundred.

- Another name for *ten hundred* is *one thousand*.

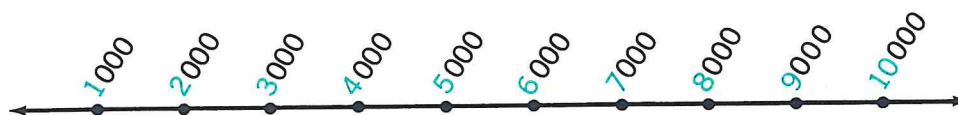
B. What hundreds are shown on the number line?



- What hundreds less than 800 are not shown?
- What is the next number of hundreds after 1900?
- Another name for *twenty hundred* is *two thousand*.

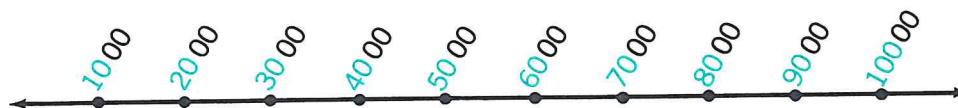
C. Read the thousands.

Begin: One thousand, two thousand, three thousand.



D. Read the thousands another way.

Begin: Ten hundred, twenty hundred, thirty hundred.



EXERCISES

Write the answer.

1. Count by hundreds from 1000 to 2500.

To help you get started, here are the first three.

1000 1100 1200

2. Count by thousands from 1000 to 10000.

To help you get started, here are the first three.

1000 2000 3000

Sometimes a comma is used in a 4-digit numeral.

It is written after the digit for the number of thousands.

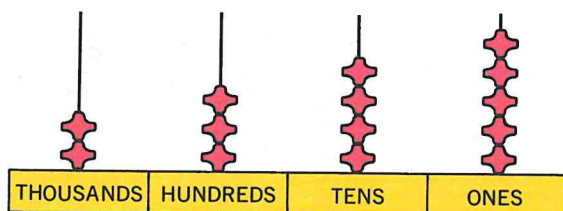
3. Write numerals for the thousands from 1,000 to 10,000 using commas. Here is how you start.

1,000 2,000 3,000

The abacus below shows 2 thousands 3 hundreds 4 tens 5 ones.

A numeral for this number is 2345 or 2,345.

4. Write a numeral for 5 thousands 2 hundreds 6 tens 8 ones.



The first numeral in the chart can be read as *two thousand five hundred thirty-six*.

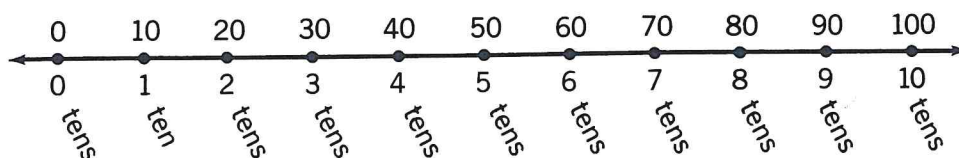
5. Read each of the other numerals.

THOUSANDS	HUNDREDS	TENS	ONES
2	5	3	6
1	4	9	2
3	8	6	4
7	3	1	8

Another way to read 2536 is *twenty-five hundred thirty-six*.

6. Read each of the other numerals in the chart this way.

ADDING AND SUBTRACTING TENS AND HUNDREDS



A. Start at 0. Count to 2 tens. Count 3 more tens.

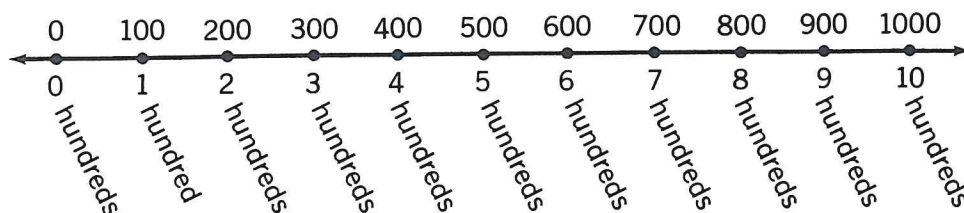
You are now at ? tens.

■ Since $2 + 3 = 5$, then 2 tens + 3 tens = 5 tens.

$$20 + 30 = \underline{\quad ? \quad}$$

■ Since $5 - 3 = 2$, then 5 tens - 3 tens = 2 tens.

$$50 - 30 = \underline{\quad ? \quad}$$



B. Start at 0. Count to 4 hundreds. Count 5 more hundreds.

You are now at ? hundreds.

■ Since $4 + 5 = 9$, then 4 hundreds + 5 hundreds = 9 hundreds.

$$400 + 500 = \underline{\quad ? \quad}$$

■ Since $9 - 5 = 4$, then 9 hundreds - 5 hundreds = 4 hundreds.

$$900 - 500 = \underline{\quad ? \quad}$$

✓ Copy and complete.

$$\begin{array}{r} 3 \text{ tens} \quad 30 \quad 70 \\ + 4 \text{ tens} \quad + 40 \quad - 40 \\ \hline 7 \text{ tens} \quad ?? \quad ?? \end{array}$$

$$\begin{array}{r} 6 \text{ hundreds} \quad 600 \quad 800 \\ + 2 \text{ hundreds} \quad + 200 \quad - 200 \\ \hline 8 \text{ hundreds} \quad ??? \quad ??? \end{array}$$

EXERCISES

Complete each sentence.

- *1. $4 + 5 = 9$, so 4 tens + 5 tens = ? tens.
2. $8 - 2 = 6$, so 8 tens - 2 tens = ? tens.
3. $7 + 1 = 8$, so 7 hundreds + 1 hundred = ? hundreds.
4. $9 - 6 = 3$, so 9 hundreds - 6 hundreds = ? hundreds.
5. $4 + 4 = 8$, so $40 + 40 = \underline{\quad}$, and $400 + 400 = \underline{\quad}$
6. $8 - 3 = 5$, so $80 - 30 = \underline{\quad}$, and $800 - 300 = \underline{\quad}$
- *7. $30 + 60 = \underline{\quad}$
- *8. $80 - 20 = \underline{\quad}$
9. $50 + 40 = \underline{\quad}$
10. $70 - 50 = \underline{\quad}$
11. $90 - 40 = \underline{\quad}$
12. $20 + 70 = \underline{\quad}$
- *13. $100 + 500 = \underline{\quad}$
- *14. $900 - 100 = \underline{\quad}$
15. $300 + 400 = \underline{\quad}$
16. $800 - 400 = \underline{\quad}$
17. $600 - 200 = \underline{\quad}$
18. $500 + 200 = \underline{\quad}$

Write the answer. Watch the sign.

- | | | | | |
|--|---|--|---|---|
| *19. $\begin{array}{r} 20 \\ + 50 \\ \hline \end{array}$ | 20. $\begin{array}{r} 80 \\ + 10 \\ \hline \end{array}$ | *21. $\begin{array}{r} 70 \\ - 40 \\ \hline \end{array}$ | 22. $\begin{array}{r} 30 \\ - 10 \\ \hline \end{array}$ | 23. $\begin{array}{r} 10 \\ + 40 \\ \hline \end{array}$ |
| 24. $\begin{array}{r} 60 \\ - 30 \\ \hline \end{array}$ | 25. $\begin{array}{r} 80 \\ - 60 \\ \hline \end{array}$ | 26. $\begin{array}{r} 50 \\ + 10 \\ \hline \end{array}$ | 27. $\begin{array}{r} 70 \\ - 20 \\ \hline \end{array}$ | 28. $\begin{array}{r} 40 \\ - 20 \\ \hline \end{array}$ |
| *29. $\begin{array}{r} 400 \\ + 300 \\ \hline \end{array}$ | 30. $\begin{array}{r} 200 \\ + 300 \\ \hline \end{array}$ | *31. $\begin{array}{r} 300 \\ - 200 \\ \hline \end{array}$ | 32. $\begin{array}{r} 700 \\ - 300 \\ \hline \end{array}$ | 33. $\begin{array}{r} 600 \\ - 400 \\ \hline \end{array}$ |
| 34. $\begin{array}{r} 600 \\ + 100 \\ \hline \end{array}$ | 35. $\begin{array}{r} 900 \\ - 300 \\ \hline \end{array}$ | 36. $\begin{array}{r} 700 \\ + 200 \\ \hline \end{array}$ | 37. $\begin{array}{r} 500 \\ + 300 \\ \hline \end{array}$ | 38. $\begin{array}{r} 600 \\ - 500 \\ \hline \end{array}$ |

Think Twice

Write the missing Egyptian numeral.

39. $\text{nn} + \text{nnn} = \underline{\quad}$
40. $\text{999999} - \text{999} = \underline{\quad}$

* 1. 9 7. 90 8. 60 13. 600 14. 800 19. 70 21. 30 29. 700 31. 100

THE COMMUTATIVE PROPERTY OF ADDITION

- A.** There are 3 girls jumping rope. Then 4 girls join them. How many are jumping rope in all?

$$3 + 4 = \square$$

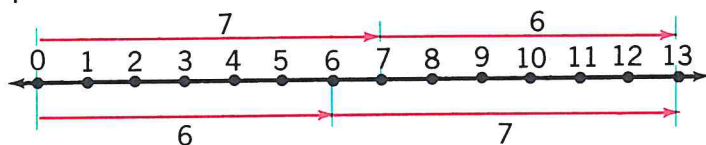


- If 4 girls are jumping rope and 3 girls join them, how many are jumping rope in all?

$$4 + 3 = \square$$



- B.** Do $7 + 6$ and $6 + 7$ equal the same number?



- $7 + 6 = \square$

- $6 + 7 = \square$

- Where do you stop if you move $5 + 4$ spaces from 0?
Where do you stop if you move $4 + 5$ spaces from 0?

Changing the order of addends does not change their sum. If \triangle and \square are any whole numbers, then $\triangle + \square = \square + \triangle$ is true.
This is the **commutative property of addition**.

- ✓ Solve these number sentences.

- $3 + 8 = 8 + \square$

- $9 + 2 = \square + 9$

- $4 + 7 = 7 + \square$

- C.** There are 3 boys playing marbles. Then 1 boy leaves the game. How many are still playing? $3 - 1 = \square$

- Suppose only 1 boy is playing marbles. Could as many as 3 boys leave the game? Does a whole number make this sentence true? $1 - 3 = \square$
- Is subtraction commutative?

D. What can you say about the sum of any whole number and 0?

- Make up a rule about adding 0 to any whole number.

$$1 + 0 = 1$$

$$2 + 0 = 2$$

$$3 + 0 = 3$$

$$4 + 0 = \underline{\quad ? \quad}$$

✓ Solve these number sentences.

$$\blacksquare 7 + 0 = \square$$

$$\blacksquare 12 + 0 = \square$$

$$\blacksquare 45 + 0 = \square$$

EXERCISES

Solve.

$$*1. 6 + 5 = \square$$

$$5 + 6 = \square$$

$$2. 8 + 0 = \square$$

$$0 + 8 = \square$$

$$3. 7 + 5 = \square$$

$$5 + 7 = \square$$

$$4. 2 + 7 = \square$$

$$7 + 2 = \square$$

$$5. 20 + 50 = \square$$

$$50 + 20 = \square$$

$$6. 400 + 200 = \square$$

$$200 + 400 = \square$$

Solve without adding or subtracting.

$$*7. 9 + 3 = 3 + \square$$

$$8. 4 + 8 = \square + 4$$

$$9. 9 + 0 = 0 + \square$$

$$10. 7 + 6 = \square + 7$$

$$11. 6 + 1 = 1 + \square$$

$$12. 0 + 2 = 2 + \square$$

$$13. \square + 4 = 4 + 9$$

$$14. \square + 2 = 2 + 5$$

$$15. 4 + \square = 6 + 4$$

$$16. 85 + 19 = 104, \text{ so}$$

$$19 + 85 = \square$$

$$17. 37 + 63 = 100, \text{ so}$$

$$63 + 37 = \square$$

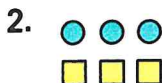
Think Twice

18. Name the sum and the addend you know in $8 - 6 = \square$. Find the other addend. Does the sum come before or after the minus sign?
19. For whole numbers, can you have a sum of 6 with one addend of 8? Can you have 6 before the minus sign and 8 after it?
20. For whole numbers, which can you have, $10 - 6$ or $6 - 10$?

* 1. 11; 11 7. 9

KEEPING UP IN MATHEMATICS

Write Yes or No. Are the sets in each pair equivalent? [1-2]



Copy and replace ● with <, =, or >. [4]

5. $4 \text{ ● } 8$

6. $1 \text{ ● } 0$

7. $2 \text{ ● } 5$

8. $9 \text{ ● } 9$

Answer the following questions about the set of pencils. [1, 5]



9. How many members are in the subset of red pencils?

10. How many members are in the subset of blue pencils?

11. How many members are in the set of pencils?

Solve these sentences. [6-7]

12. $4 + 2 = \square$

13. $2 + 4 = \square$

14. $8 + 0 = \square$

15. $3 + 5 = \square$

16. $\square = 2 + 6$

17. $\square = 8 + 1$

18. $\square = 4 + 3$

19. $\square = 5 + 5$

Solve these sentences. [8-11]

20. $6 - 4 = \square$

21. $8 - 2 = \square$

22. $7 - 4 = \square$

23. $5 - 3 = \square$

24. $3 + \square = 6$

25. $8 + \square = 8$

26. $\square + 4 = 5$

27. $\square + 6 = 8$

Write four true number sentences for each number family. [10-11]

28. {3, 2, 5}

29. {1, 5, 6}

30. {2, 7, 9}

31. {4, 3, 7}

Solve these problems. [11-12, 17]

32. Tom has 2 dimes and 4 nickels. Mary has 3 dimes and 1 nickel. Who has more money?

33. You want to buy a toy. It costs 12¢. You have 8¢. How much more do you need?

34. Lucy bought a candy bar for 6¢. She bought an ice cream cone for 16¢. How much did she spend?

35. Suppose you had 50¢ and you spent 30¢ on a magazine. How much would you have left?

APPROXIMATIONS TO THE NEAREST TEN

A. Leroy asked Earl, "How many marbles do you have?"
Earl said, "I have about 50 marbles."

- Could Earl have 52 marbles?
Could he have 48 marbles?
- Earl used an **approximation** for the number of marbles he has. What do you think an approximation is?



B. To find an approximation for 48, you can think:

- Between what two tens is 48?
- Is 8 nearer to 0 or to 10?
- Is 48 nearer to 40 or to 50?
- Then 50 is the approximation to the nearest ten for 48.



✓ Give the approximation to the nearest ten for each.

68 32 89 27 51 76

EXERCISES

Which member of the set is nearer to the given number?

- *1. 51 {50, 60} 2. 47 {40, 50} 3. 83 {80, 90}

Give the approximation to the nearest ten for each.

- *4. 22 5. 39 6. 46 7. 81 8. 93 9. 56

Give the approximation to the nearest ten for each number.

*10. The tallest living animal is the giraffe.

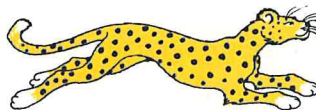
One living in Kenya was 19 feet tall.

11. The fastest animal is the cheetah.

One ran as fast as 71 miles an hour.

12. The fastest fish is the sailfish.

One swam as fast as 68 miles per hour.



APPROXIMATIONS TO THE NEAREST HUNDRED

- A.** Rita asked Lucy, "How many stamps do you have?"
Lucy said, "I have about 400."

- Could Lucy have 432 stamps?
Could she have 375 stamps?



- B.** To find an approximation for 432 you can think:

- Between what two hundreds is 432?
- Is 32 nearer to 0 or to 100?
- Is 432 nearer to 400 or to 500?

- Then 400 is the approximation to the nearest hundred for 432.



- ✓ Give the approximation to the nearest hundred for each.

234

698

418

876

359

745

EXERCISES

Which member of the set is nearer to the given number.

- *1. 314 {300, 400} 2. 288 {200, 300} 3. 534 {500, 600}

Give the approximation to the nearest hundred for each.

- *4. 128 5. 285 6. 344 7. 721 8. 655 9. 476

Give the approximation to the nearest hundred for each number.

- *10. The fastest flying animal is the spine-tailed swift.

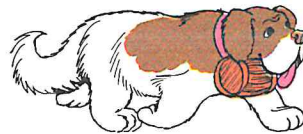
One flew as fast as 219 miles per hour.

11. The heaviest mammal is the blue whale

One weighed as much as 195 tons.

12. The heaviest dog is the Saint Bernard.

One, who lived in England, weighed 259 pounds.



* 1. 300 4. 100 10. 200

ESTIMATING SUMS

A. To **estimate** a sum, you find a number that is near the sum.

To estimate the sum of 37 and 52, you use only tens.

$$\begin{array}{rcl} 37 & \longrightarrow & \text{Is 37 nearer to 30 or to 40?} \longrightarrow 40 \\ + 52 & \longrightarrow & \text{Is 52 nearer to 50 or to 60?} \longrightarrow +50 \\ \hline & & \text{Then } 37 + 52 \text{ is near } 40 + 50. \longrightarrow 90 \end{array}$$

B. To estimate the sum of 421 and 167, you use only hundreds.

$$\begin{array}{rcl} 421 & \longrightarrow & \text{Is 421 nearer to 400 or to 500?} \longrightarrow 400 \\ + 167 & \longrightarrow & \text{Is 167 nearer to 100 or to 200?} \longrightarrow +200 \\ \hline & & \text{Then } 421 + 167 \text{ is near } 400 + 200. \longrightarrow 600 \end{array}$$

✓ Estimate each sum.

$\begin{array}{r} 41 \\ + 28 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ + 30 \\ \hline ?? \end{array}$	$\begin{array}{r} 87 \\ + 36 \\ \hline \end{array}$	$\begin{array}{r} 90 \\ + 40 \\ \hline ??? \end{array}$	$\begin{array}{r} 369 \\ + 221 \\ \hline \end{array}$	$\begin{array}{r} 400 \\ + 200 \\ \hline ??? \end{array}$	$\begin{array}{r} 721 \\ + 112 \\ \hline \end{array}$	$\begin{array}{r} 700 \\ + 100 \\ \hline ??? \end{array}$
---	--	---	---	---	---	---	---

EXERCISES

Estimate the sum. Choose the best answer from the given set.

- | | |
|---------------------------------|--------------------------------|
| *1. $41 + 37$ {70, 80, 90} | 2. $28 + 41$ {60, 70, 80} |
| 3. $26 + 49$ {60, 70, 80} | 4. $52 + 12$ {60, 70, 80} |
| *5. $314 + 272$ {500, 600, 700} | 6. $476 + 321$ {700, 800, 900} |
| 7. $521 + 215$ {700, 800, 900} | 8. $278 + 492$ {600, 700, 800} |

Estimate each sum.

*9. $\begin{array}{r} 42 \\ + 37 \\ \hline \end{array}$	10. $\begin{array}{r} 67 \\ + 23 \\ \hline \end{array}$	11. $\begin{array}{r} 81 \\ + 12 \\ \hline \end{array}$	*12. $\begin{array}{r} 223 \\ + 382 \\ \hline \end{array}$	13. $\begin{array}{r} 365 \\ + 518 \\ \hline \end{array}$	14. $\begin{array}{r} 487 \\ + 199 \\ \hline \end{array}$
---	---	---	--	---	---

* 1. 80 5. 600 9. 80 12. 600

ADDING ONES, TENS, AND HUNDREDS

Frank has 53 seashells in one box. He has 42 seashells in another box. How many shells does he have in both boxes?



A. Do you add or do you subtract to find the answer?

■ Estimate your answer.

B. Here is one way to find the sum.

$$\begin{array}{r} 5 \text{ tens } 3 \text{ ones} \\ + 4 \text{ tens } 2 \text{ ones} \\ \hline 5 \text{ ones} \end{array}$$

Add the ones.



$$\begin{array}{r} 5 \text{ tens } 3 \text{ ones} \\ + 4 \text{ tens } 2 \text{ ones} \\ \hline 9 \text{ tens } 5 \text{ ones} \end{array}$$

Add the tens.

C. Here is another way to find the sum.

$$\begin{array}{r} 50 + 3 \\ + 40 + 2 \\ \hline 5 \end{array}$$

Add the ones.



$$\begin{array}{r} 50 + 3 \\ + 40 + 2 \\ \hline 90 + 5 \end{array}$$

Add the tens.

D. Here is the shortest way to find the sum.

$$\begin{array}{r} 53 \\ + 42 \\ \hline 5 \end{array}$$

Add the ones.



$$\begin{array}{r} 53 \\ + 42 \\ \hline 95 \end{array}$$

Add the tens.

■ How are the three ways alike? How are they different?

✓ Use each of the three ways to find the sum of 427 and 361.

$$\begin{array}{r} 4 \text{ hundreds } 2 \text{ tens } 7 \text{ ones} \\ + 3 \text{ hundreds } 6 \text{ tens } 1 \text{ one} \\ \hline ? \text{ hundreds } ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} 400 + 20 + 7 \\ + 300 + 60 + 1 \\ \hline ??? + ?? + ? \end{array}$$

$$\begin{array}{r} 427 \\ + 361 \\ \hline ??? \end{array}$$

EXERCISES

Find the sum.

$$\begin{array}{r} *1. \quad 2 \text{ tens } 4 \text{ ones} \\ + 3 \text{ tens } 5 \text{ ones} \\ \hline \quad ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} 3. \quad 8 \text{ tens } 6 \text{ ones} \\ + 1 \text{ ten } 2 \text{ ones} \\ \hline \quad ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} *5. \quad 70 + 5 \\ + 10 + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 5 \text{ hundreds } 6 \text{ tens } 4 \text{ ones} \\ + 1 \text{ hundred } 2 \text{ tens } 3 \text{ ones} \\ \hline \quad ? \text{ hundreds } ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} 4. \quad 2 \text{ hundreds } 3 \text{ tens } 6 \text{ ones} \\ + 2 \text{ hundreds } 2 \text{ tens } 0 \text{ ones} \\ \hline \quad ? \text{ hundreds } ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} 6. \quad 500 + 40 + 8 \\ + 200 + 10 + 1 \\ \hline \end{array}$$

Estimate each sum. Then find the answer.

$$\begin{array}{r} *7. \quad 32 \\ + 46 \\ \hline \end{array} \quad \begin{array}{r} 8. \quad 56 \\ + 23 \\ \hline \end{array} \quad \begin{array}{r} 9. \quad 43 \\ + 55 \\ \hline \end{array} \quad \begin{array}{r} 10. \quad 29 \\ + 30 \\ \hline \end{array} \quad \begin{array}{r} *11. \quad 371 \\ + 410 \\ \hline \end{array} \quad \begin{array}{r} 12. \quad 532 \\ + 241 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 874 \\ + 124 \\ \hline \end{array} \quad \begin{array}{r} 14. \quad 542 \\ + 225 \\ \hline \end{array} \quad \begin{array}{r} 15. \quad 524 \\ + 125 \\ \hline \end{array} \quad \begin{array}{r} 16. \quad 632 \\ + 214 \\ \hline \end{array} \quad \begin{array}{r} 17. \quad 436 \\ + 111 \\ \hline \end{array} \quad \begin{array}{r} 18. \quad 764 \\ + 320 \\ \hline \end{array}$$

Find the sum.

$$\begin{array}{lll} *19. \quad 74 + 21 = ? & 20. \quad 42 + 53 = ? & 21. \quad 54 + 32 = ? \\ 22. \quad 40 + 38 = ? & 23. \quad 27 + 61 = ? & 24. \quad 13 + 25 = ? \\ *25. \quad 431 + 158 = ? & 26. \quad 137 + 810 = ? & 27. \quad 124 + 553 = ? \\ 28. \quad 712 + 240 = ? & 29. \quad 831 + 167 = ? & 30. \quad 586 + 312 = ? \end{array}$$

Think Twice

Name the sum, using Egyptian numerals.

$$\begin{array}{r} 31. \quad \text{nnnn} \\ + \text{nnnn} \\ \hline \end{array} \quad \begin{array}{r} 32. \quad \text{nnnn} \\ + \text{nnnnnn} \\ \hline \end{array} \quad \begin{array}{r} 33. \quad \text{nnnn} \\ + \text{nnnn} \\ \hline \end{array} \quad \begin{array}{r} 34. \quad \text{nnnn} \\ + \text{nnnnnn} \\ \hline \end{array}$$

* 1. 5 tens 9 ones, or 59. 5. 80 + 8 or 88 7. 80, 78 11. 800, 781 19. 95 25. 589

SUBTRACTING ONES, TENS, AND HUNDREDS

A school bus is carrying 43 pupils. At the first stop, 21 pupils get off. How many pupils are still on the bus?



A. Do you add or subtract to find the answer?

■ Estimate the answer first.

43 \longrightarrow Is 43 nearer to 40 or to 50? \longrightarrow 40
 -21 \longrightarrow Is 21 nearer to 20 or to 30? \longrightarrow -20
 Then $43 - 21$ is near $40 - 20$. \longrightarrow 20

B. Here is one way to find the simplest name for $43 - 21$.

4 tens	3 ones
-2 tens	1 one
<hr/>	
	2 ones

Subtract the ones.



4 tens	3 ones
-2 tens	1 one
<hr/>	
2 tens	2 ones

Subtract the tens.

C. Here is a shorter way to find the answer.

4	3
-2	1
<hr/>	
	2

Subtract the ones.



4	3
-2	1
<hr/>	
2	2

Subtract the tens.

■ How are the ways in **B** and **C** alike?
 How are they different?

✓ Use the ways shown in **B** and **C** to find $574 - 341$.

5 hundreds	7 tens	4 ones
-3 hundreds	4 tens	1 one
<hr/>		
?	?	?

574
-341
<hr/>
???

EXERCISES

Subtract to find the answer.

- | | | |
|---|--|--|
| *1. $\begin{array}{r} 6 \text{ tens } 8 \text{ ones} \\ - 3 \text{ tens } 2 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$ | 2. $\begin{array}{r} 9 \text{ tens } 8 \text{ ones} \\ - 7 \text{ tens } 6 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$ | 3. $\begin{array}{r} 5 \text{ tens } 9 \text{ ones} \\ - 4 \text{ tens } 0 \text{ ones} \\ \hline ? \text{ ten } ? \text{ ones} \end{array}$ |
| 4. $\begin{array}{r} 4 \text{ hundreds } 8 \text{ tens } 5 \text{ ones} \\ - 2 \text{ hundreds } 4 \text{ tens } 3 \text{ ones} \\ \hline ? \text{ hundreds } ? \text{ tens } ? \text{ ones} \end{array}$ | 5. $\begin{array}{r} 7 \text{ hundreds } 4 \text{ tens } 2 \text{ ones} \\ - 6 \text{ hundreds } 2 \text{ tens } 0 \text{ ones} \\ \hline ? \text{ hundred } ? \text{ tens } ? \text{ ones} \end{array}$ | |
| 6. $\begin{array}{r} 6 \text{ hundreds } 9 \text{ tens } 3 \text{ ones} \\ - 3 \text{ hundreds } 9 \text{ tens } 1 \text{ one} \\ \hline ? \text{ hundreds } ? \text{ tens } ? \text{ ones} \end{array}$ | 7. $\begin{array}{r} 5 \text{ hundreds } 7 \text{ tens } 6 \text{ ones} \\ - 4 \text{ hundreds } 1 \text{ ten } 5 \text{ ones} \\ \hline ? \text{ hundred } ? \text{ tens } ? \text{ one} \end{array}$ | |

Estimate the answer. Then find the answer.

- | | | | | | |
|---|---|---|---|---|---|
| *8. $\begin{array}{r} 96 \\ - 62 \\ \hline \end{array}$ | 9. $\begin{array}{r} 87 \\ - 43 \\ \hline \end{array}$ | 10. $\begin{array}{r} 56 \\ - 23 \\ \hline \end{array}$ | 11. $\begin{array}{r} 69 \\ - 47 \\ \hline \end{array}$ | 12. $\begin{array}{r} 26 \\ - 20 \\ \hline \end{array}$ | 13. $\begin{array}{r} 94 \\ - 33 \\ \hline \end{array}$ |
| 14. $\begin{array}{r} 83 \\ - 61 \\ \hline \end{array}$ | 15. $\begin{array}{r} 49 \\ - 29 \\ \hline \end{array}$ | 16. $\begin{array}{r} 963 \\ - 361 \\ \hline \end{array}$ | 17. $\begin{array}{r} 865 \\ - 431 \\ \hline \end{array}$ | 18. $\begin{array}{r} 751 \\ - 220 \\ \hline \end{array}$ | 19. $\begin{array}{r} 867 \\ - 402 \\ \hline \end{array}$ |

Find the answer.

- | | | |
|---------------------------|---------------------------|---------------------------|
| *20. $74 - 23 = \square$ | 21. $99 - 88 = \square$ | 22. $76 - 65 = \square$ |
| 23. $38 - 11 = \square$ | 24. $57 - 20 = \square$ | 25. $64 - 42 = \square$ |
| 26. $647 - 126 = \square$ | 27. $319 - 117 = \square$ | 28. $798 - 452 = \square$ |
| 29. $742 - 420 = \square$ | 30. $245 - 114 = \square$ | 31. $965 - 732 = \square$ |

Think Twice

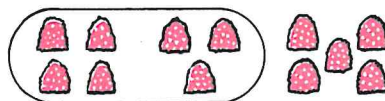
Name the answer using Egyptian numerals.

- | | | |
|---|---|--|
| 32. $\begin{array}{r} \text{nnnnnlll} \\ - \quad \text{nnll} \\ \hline \end{array}$ | 33. $\begin{array}{r} \text{ppppnnlll} \\ - \quad \text{pnl} \\ \hline \end{array}$ | 34. $\begin{array}{r} \text{ppppnnnnllll} \\ - \quad \text{pnnnnll} \\ \hline \end{array}$ |
|---|---|--|

* 1. 3 tens 6 ones, or 36. 8. 40, 34 20. 51

THE ASSOCIATIVE PROPERTY OF ADDITION

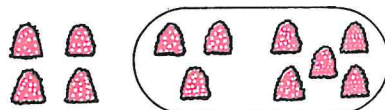
A. Three sets of gumdrops are shown at the right.



$$(4 + 3) + 5$$

- What do the three numbers tell you about the three sets of gumdrops?
- Which sets are grouped together with a ring?
- The numbers 4 and 3 are grouped, or associated, together. The *parentheses* show this. You add 4 and 3 first.

B. The same sets are shown again.



$$4 + (3 + 5)$$

- Which sets are grouped together this time?
- Which two numbers are associated this time?

C. How many gumdrops are shown in **A**? in **B**? Does the way the gumdrops are grouped change the number of gumdrops?

- Add 4 and 3 first. Now add 5 to your answer.
 $(4 + 3) + 5 = 7 + 5 = \underline{\quad ? \quad}$
- Add 3 and 5 first. Now add your answer to 4.
 $4 + (3 + 5) = 4 + 8 = \underline{\quad ? \quad}$
- Are the answers the same? Does the way you associate the numbers change the sum?

The way addends are grouped does not change their sum. If \square , \triangle , and \diamond are any whole numbers, then $(\square + \triangle) + \diamond = \square + (\triangle + \diamond)$ is true. This is the **associative property of addition**.

✓ Solve these sentences.

$$(2 + 5) + 3 = 2 + (5 + \square)$$

$$(5 + 3) + 6 = \square + (3 + 6)$$

EXERCISES

Find the sum.

*1. $(4 + 6) + 2 = \square$

3. $(3 + 2) + 4 = \square$

5. $(20 + 10) + 30 = \square$

7. $(500 + 200) + 100 = \square$

2. $4 + (6 + 2) = \square$

4. $3 + (2 + 4) = \square$

6. $20 + (10 + 30) = \square$

8. $500 + (200 + 100) = \square$

Copy and replace \bullet with $<$, $=$, or $>$ to make the sentence true.

*9. $(4 + 3) + 2 \bullet 4 + (3 + 2)$

10. $(5 + 2) + 3 \bullet 5 + (2 + 5)$

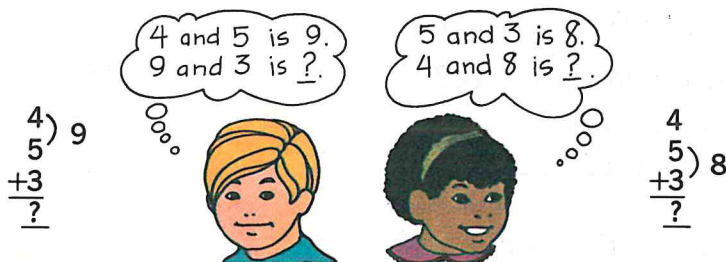
11. $(2 + 4) + 6 \bullet 2 + (4 + 3)$

12. $(3 + 2) + 7 \bullet 3 + (2 + 7)$

13. $(5 + 3) + 1 \bullet 5 + (6 + 1)$

14. $(2 + 6) + 3 \bullet 2 + (3 + 5)$

Follow the curves to add.



Find the sum.

*15.
$$\begin{array}{r} 5 \\ 2 \\ +3 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 8 \\ 1 \\ +3 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 30 \\ 20 \\ +10 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 20 \\ 40 \\ +30 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 300 \\ 100 \\ +200 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 6 \\ 2 \\ +4 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 4 \\ 2 \\ +8 \\ \hline \end{array}$$

22.
$$\begin{array}{r} 40 \\ 50 \\ +10 \\ \hline \end{array}$$

23.
$$\begin{array}{r} 60 \\ 10 \\ +30 \\ \hline \end{array}$$

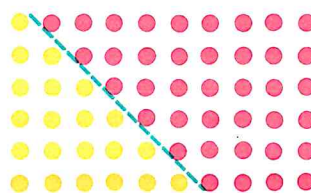
24.
$$\begin{array}{r} 200 \\ 300 \\ +700 \\ \hline \end{array}$$

* 1. 12 9. $(4 + 3) + 2 = 4 + (3 + 2)$ 15. 10

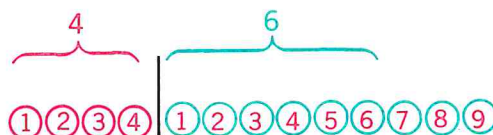
FACTS WITH ONE ADDEND OF 6 OR LESS

- A.** Use the array to find the number that goes with each to make 10.

$$\begin{array}{ll} 1 + \square = 10 & 2 + \square = 10 \\ 3 + \square = 10 & 4 + \square = 10 \\ 5 + \square = 10 & 6 + \square = 10 \end{array}$$



- B.** Since $4 + 6 = 10$,
then $4 + 7 = \square$,
and $4 + 8 = \square$,
and $4 + 9 = \square$.



- C.** To add 4 and 9, you can think:

4 and how many make 10?

- Think of 9 as $6 + 3$.

So, $4 + 6$ is 10 and 3 more is 13.

$$4 + 9 = \square$$

$$4 + (6 + 3) = \square$$

$$(4 + 6) + 3 = \square$$

$$10 + 3 = \square$$

- D.** You know addition is commutative.

- $4 + 6 = 10$, so $6 + 4 = \square$

- $4 + 7 = 11$, so $7 + 4 = \square$

- $4 + 8 = 12$, so $8 + 4 = \square$

- $4 + 9 = 13$, so $9 + 4 = \square$

- E.** You can use doubles. Since $5 + 5 = 10$, then

- $5 + 6 = \square$ and $6 + 5 = \square$.

- $5 + 7 = \square$ and $7 + 5 = \square$.

- $5 + 8 = \square$ and $8 + 5 = \square$.

- $5 + 9 = \square$ and $9 + 5 = \square$.

- F.** You can write two subtraction facts for the number family $\{4, 6, 10\}$. They are $10 - 6 = 4$ and $10 - 4 = 6$.

- Write two subtraction facts for each number family.

$$\{4, 7, 11\}$$

$$\{4, 8, 12\}$$

$$\{4, 9, 13\}$$

$$\{5, 6, 11\}$$

$$\{5, 7, 12\}$$

$$\{5, 8, 13\}$$

$$\{6, 7, 13\}$$

$$\{6, 8, 14\}$$

$$\{6, 9, 15\}$$

EXERCISES

Solve. If you need it, use the fact $4 + 6 = 10$.

*1. $4 + 8 = \square$

2. $4 + 10 = \square$

3. $4 + 7 = \square$

4. $4 + 9 = \square$

5. $10 - 4 = \square$

6. $13 - 4 = \square$

7. $11 - 4 = \square$

8. $12 - 4 = \square$

9. $12 - 8 = \square$

10. $14 - 10 = \square$

11. $13 - 9 = \square$

12. $11 - 7 = \square$

If you need it, use the fact $5 + 5 = 10$.

*13. $5 + 7 = \square$

14. $5 + 6 = \square$

15. $5 + 9 = \square$

16. $5 + 8 = \square$

17. $11 - 5 = \square$

18. $13 - 5 = \square$

19. $12 - 5 = \square$

20. $14 - 5 = \square$

21. $13 - 8 = \square$

22. $15 - 10 = \square$

23. $14 - 9 = \square$

24. $12 - 7 = \square$

If you need it, use the fact $6 + 4 = 10$.

*25. $6 + 6 = \square$

26. $6 + 8 = \square$

27. $6 + 7 = \square$

28. $6 + 9 = \square$

29. $15 - 6 = \square$

30. $13 - 6 = \square$

31. $14 - 6 = \square$

32. $12 - 6 = \square$

Study each fact. Then cover the answer and try to write it.

Practice until you can write every answer correctly.

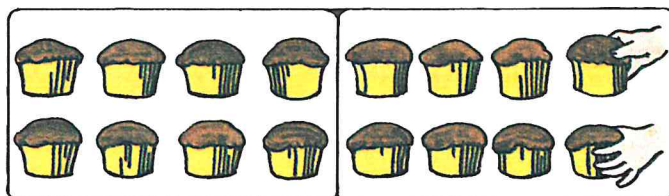
33.	8	34.	9	35.	6	36.	8	37.	9	38.	4
	$+6$		$+5$		$+7$		$+5$		$+6$		$+9$
	<u>14</u>		<u>14</u>		<u>13</u>		<u>13</u>		<u>15</u>		<u>13</u>

39.	15	40.	14	41.	12	42.	13	43.	14	44.	13
	-9		-5		-9		-5		-8		-6
	<u>6</u>		<u>9</u>		<u>3</u>		<u>8</u>		<u>6</u>		<u>7</u>

Keeping Up with the Facts

1.	5	2.	3	3.	5	4.	8	5.	9	6.	1
	$+4$		$+6$		$+3$		-4		-7		-0
	<u> </u>		<u> </u>		<u> </u>		<u> </u>		<u> </u>		<u> </u>

WRITING NUMBER SENTENCES



- A.** Mother baked 8 cupcakes. Earl took 2 cupcakes.
You are to find how many cupcakes are left.

- Are sets being joined or separated?
Do you add or do you subtract?
- Which number sentence fits the problem?
 $8 + 2 = \square$ $8 - 2 = \square$
- Use the correct number sentence to find the answer.



- B.** Fred saw there were only 3 bottles of soda left.
Then mother bought 6 bottles of soda.
You are to find how many bottles there are now.

- Are the sets being joined or separated?
Do you add or do you subtract?
- Which number sentence fits the problem?
 $3 + 6 = \square$ $6 - 3 = \square$
- Use the correct number sentence to find the answer.

- ✓ Write a number sentence to fit this problem.
There are 5 redbirds and 3 bluebirds sitting on a fence.
How many birds are sitting on the fence?

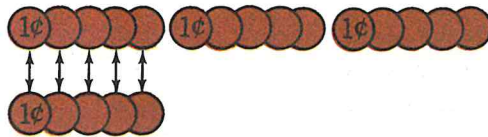
EXERCISES

Write a number sentence to fit each problem.
Then solve the number sentence.

1. Judy has 8 eggs. She breaks 3.
How many eggs are not broken?



2. Sam has 5 cents.
He needs 15 cents.
How much more does he need?



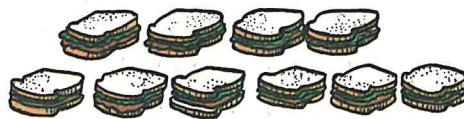
3. Lester earned 7 cub scout badges last year. He has earned 4 more this year.
How many badges is that?



4. For a game Ella set 5 chairs toward the window. She put 6 chairs toward the door.
How many chairs is that?



5. Lucy made 4 peanut butter sandwiches and 6 jelly sandwiches. How many is that?



6. Tom has 10 cents. He spends 6 cents. How much money does he have now?
7. It takes 11 boys to make a football team. Frank and his friends have only 8 players. How many more do they need?
8. There are 12 children playing hide-and-seek. If 9 are found, how many more are still hiding?

CHECKPOINT

- ✓ Check your understanding of **key terms and key phrases**.
Use each in a sentence.

commutative property of addition

estimate

associative property of addition

parentheses

approximation

place-value numeral

- ✓ Check your understanding of **key ideas**.

1a. Solve.

If $\triangle + \square = \diamond$, then $\square + \triangle = \underline{\quad}$.

1b. Tell the commutative property of addition.

2a. Solve.

$(28 + 53) + 69 = 28 + (53 + \underline{\quad})$

2b. Tell the associative property of addition.

3a. $4 + 5 = 9$, so $40 + 50 = \underline{\quad}$

$7 + 1 = 8$, so $700 + 100 = \underline{\quad}$

3b. How is adding tens or hundreds like adding ones?

4a. Give an approximation for each to the nearest ten and to the nearest hundred.

7 13 39 462 577

4b. How do you find an approximation for a number to the nearest ten? for a number to the nearest hundred?

- ✓ Check your **skills**.

Watch the signs as you add or subtract.

1.	9	2.	8	3.	7	4.	14	5.	12	6.	11
	$\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$		$\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$		$\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$		$\begin{array}{r} 14 \\ -7 \\ \hline \end{array}$		$\begin{array}{r} 12 \\ -3 \\ \hline \end{array}$		$\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$

Write an approximation first. Then write the answer.

7.	33	8.	67	9.	245	10.	29	11.	78	12.	586
	$\begin{array}{r} 33 \\ +23 \\ \hline \end{array}$		$\begin{array}{r} 67 \\ +21 \\ \hline \end{array}$		$\begin{array}{r} 245 \\ +652 \\ \hline \end{array}$		$\begin{array}{r} 29 \\ -16 \\ \hline \end{array}$		$\begin{array}{r} 78 \\ -34 \\ \hline \end{array}$		$\begin{array}{r} 586 \\ -475 \\ \hline \end{array}$

UNIT TEST

Find the answers.

1. Which names the greater number $\cap\cap\cap\cap\cap\cap$ or $\cap\cap\cap\cap\cap\cap$?
2. What place-value numeral shows 5 tens and 2 ones?
3. Write these in order from least to greatest?
 $\{42, 229, 24, 291, 131\}$
4. The teacher needs 30 books for her class. She has 20 books. How many more books does she need?
5. What is the approximation to the nearest ten for 51?
What is the approximation to the nearest hundred for 180?

What number makes each sentence true?

6. $(7 + 3) + 8 = \triangle$
7. $(7 + 5) + 3 = 7 + (\square + 3)$
8. $14 + 13 = 13 + \triangle$

Find the answers.

$$\begin{array}{r} 9. \quad 679 \\ + 210 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 84 \\ - 33 \\ \hline \end{array}$$

If you have time, try these.

11. Is 385 or is 425 closer to 400?
12. Is 425 or is 485 closer to 450?

MATHAMUSEMENTS

Find the pattern.

1, 3, 5, 7, ?, ?, ?, ?

1, 4, 7, 10, ?, ?, ?, ?

5, 6, 10, 11, 15, ?, ?, ?

INQUIRY INTO NUMBER

Arrow Arithmetic

On these pages arrows are used to tell you how to move around the chart.

- Can you solve this sentence?

$$17 \rightarrow n$$

HOW TO MOVE

Start at 17 on the chart.
The symbol \rightarrow tells you to move 1 space to the right.
This sentence is true.

$$17 \rightarrow 18$$

- What do you think these arrows tell you to do?

\downarrow \leftarrow \uparrow

This sentence is also true. $17 \rightarrow \rightarrow 19$

- What do you think these arrows tell you to do?

$\downarrow \downarrow$ $\leftarrow \leftarrow$ $\uparrow \uparrow$

Copy and complete the tables.

START ON	MOVE	STOP ON
36	\rightarrow	<u>?</u>
25	\leftarrow	<u>?</u>
42	\leftarrow	<u>?</u>
64	\uparrow	54
87	\uparrow	<u>?</u>
53	\downarrow	<u>?</u>
14	\downarrow	<u>?</u>

START ON	MOVE	STOP ON
23	$\rightarrow \rightarrow$	<u>?</u>
46	$\leftarrow \leftarrow$	<u>?</u>
57	$\downarrow \downarrow$	77
95	$\downarrow \downarrow$	<u>?</u>
38	$\uparrow \uparrow$	<u>?</u>
16	$\rightarrow \rightarrow$	<u>?</u>
29	$\leftarrow \leftarrow$	<u>?</u>

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

This sentence is true. $27 \rightarrow \downarrow 38$

- What do you think these arrows tell you to do?

$\rightarrow \downarrow \quad \rightarrow \uparrow \quad \leftarrow \downarrow \quad \leftarrow \uparrow$

Copy and complete the tables.

START ON	MOVE	STOP ON	START ON	MOVE	STOP ON
55	$\rightarrow \downarrow$	66	37	$\downarrow \uparrow$	<u>?</u>
82	$\rightarrow \downarrow$	<u>?</u>	51	$\leftarrow \rightarrow$	<u>?</u>
37	$\rightarrow \uparrow$	<u>?</u>	79	$\uparrow \downarrow$	<u>?</u>
64	$\leftarrow \downarrow$	<u>?</u>	90	$\rightarrow \uparrow$	<u>?</u>
21	$\leftarrow \uparrow$	<u>?</u>	90	$\uparrow \rightarrow$	<u>?</u>
75	$\rightarrow \uparrow$	<u>?</u>	85	$\downarrow \leftarrow$	<u>?</u>
42	$\rightarrow \uparrow$	<u>?</u>	85	$\leftarrow \downarrow$	<u>?</u>

Solve and compare your answers.

$52 \rightarrow \uparrow n \quad 52 \uparrow \rightarrow n$

- Do you think it matters in what order you follow the arrows?
- Try some other moves to check your answer.

This sentence is true. $36 \searrow 47$.

- What do you think these arrows tell you to do?

$\searrow \quad \nearrow \quad \nwarrow \quad \swarrow$

Copy and complete the tables.

START ON	MOVE	STOP ON	START ON	MOVE	STOP ON
42	\searrow	<u>?</u>	52	$\nearrow \nearrow$	<u>?</u>
25	\swarrow	<u>?</u>	19	$\nearrow \searrow$	<u>?</u>
67	\nearrow	<u>?</u>	36	$\searrow \nearrow$	<u>?</u>
34	\nwarrow	<u>?</u>	48	$\nearrow \nearrow$	<u>?</u>
88	\searrow	<u>?</u>	75	$\swarrow \swarrow$	<u>?</u>
92	\nwarrow	<u>?</u>	26	$\nearrow \swarrow$	<u>?</u>

ONE ADDEND OF 7 OR LESS



A. Chris has 7 cents. She earns 3 cents more.

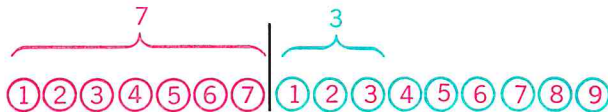
- How much does she have now?

$$7 + 3 = \square$$

- You can use n in place of \square . Solve this sentence.

$$7 + 3 = n$$

B. You know that $7 + 3 = 10$. Use this fact and use the circles to help you solve the sentences.



$$7 + 4 = n$$

$$7 + 5 = n$$

$$7 + 6 = n$$

$$7 + 7 = n$$

$$7 + 8 = n$$

$$7 + 9 = n$$

C. Use doubles to find the answers.

- Since $7 + 7 = 14$, then $7 + 8 = \underline{\quad ? \quad}$ and $7 + 9 = \underline{\quad ? \quad}$.
- Since $7 + 7 = 14$, then $7 + 6 = \underline{\quad ? \quad}$ and $7 + 5 = \underline{\quad ? \quad}$.

D. Four facts can be written using the number family $\{7, 6, 13\}$.

$$7 + 6 = 13$$

$$13 - 6 = \underline{\quad ? \quad}$$

$$6 + 7 = \underline{\quad ? \quad}$$

$$13 - 7 = 6$$

- Write two addition and two subtraction facts for each.

$\{7, 2, 9\}$

$\{7, 4, 11\}$

$\{5, 7, 12\}$

EXERCISES

Solve.

*1. $7 + 3 = n$

2. $7 + 5 = n$

3. $7 + 7 = n$

4. $7 + 0 = n$

5. $7 + 4 = n$

6. $7 + 8 = n$

*7. $10 - 3 = n$

8. $12 - 5 = n$

9. $14 - 7 = n$

10. $16 - 7 = n$

11. $11 - 4 = n$

12. $15 - 7 = n$

What is the missing addend?

*13. $\{7, \underline{\quad}, 10\}$

14. $\{7, \underline{\quad}, 12\}$

15. $\{7, \underline{\quad}, 13\}$

16. $\{7, \underline{\quad}, 15\}$

17. $\{7, \underline{\quad}, 16\}$

18. $\{7, \underline{\quad}, 11\}$

Write four facts for each number family.

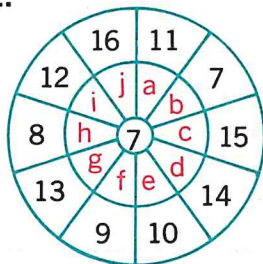
*19. $\{7, 8, 15\}$

20. $\{7, 9, 16\}$

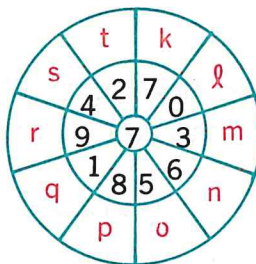
21. $\{7, 3, 10\}$

The two inside rings are for addends. The outside ring is for a sum. Replace each letter with the correct sum or addend.

22.



23.



Keeping Up with the Facts

1. 2 twos = n

2. 2 fives = n

3. 2 sixes = n

4. 2 sevens = n

5. $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$

6. $\begin{array}{r} 6 \\ +9 \\ \hline \end{array}$

7. $\begin{array}{r} 6 \\ +8 \\ \hline \end{array}$

8. $\begin{array}{r} 6 \\ +0 \\ \hline \end{array}$

9. $\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$

10. $\begin{array}{r} 6 \\ +4 \\ \hline \end{array}$

11. $\begin{array}{r} 14 \\ -6 \\ \hline \end{array}$

12. $\begin{array}{r} 6 \\ -6 \\ \hline \end{array}$

13. $\begin{array}{r} 13 \\ -6 \\ \hline \end{array}$

14. $\begin{array}{r} 15 \\ -6 \\ \hline \end{array}$

15. $\begin{array}{r} 12 \\ -6 \\ \hline \end{array}$

16. $\begin{array}{r} 11 \\ -6 \\ \hline \end{array}$

* 1. 10 7. 7 13. 3 19. $7 + 8 = 15$; $8 + 7 = 15$; $15 - 8 = 7$; $15 - 7 = 8$

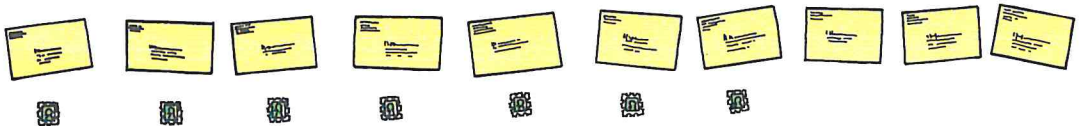
USING THE FACTS



- A.** Patty had her tonsils taken out. She got 7 get-well cards on Monday. She got 9 more cards on Tuesday. How many cards is that?

■ 7 cards and 9 cards is how many cards? $7 + 9 = n$

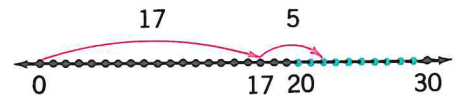
- B.** Tina has 10 letters to mail. She has 7 stamps. How many more stamps does she need?



- 7 and how many more is 10? $7 + n = 10$
 ■ Why can you also use this sentence? $10 - 7 = n$

- C.** Harry has 17 stamps in his book. He puts in 5 more.

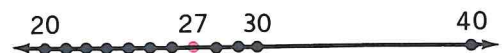
- Does he have as many as 20?
 Does he have more than 20?
 Is $17 + 5$ in the 20's?



- D.** What number added to 27 is 30?

$$27 + n = 30$$

- If you add more than 3 to 27, is the sum greater than, equal to, or less than 30?
 ■ Which sums are in the 30's?



$$27 + 4$$

$$27 + 1$$

$$27 + 6$$

$$27 + 8$$

$$27 + 5$$

$$27 + 2$$

$$27 + 9$$

$$27 + 0$$

EXERCISES

Write only the answer to the problem.

- *1. 7 bear cubs in one cage.
5 bear cubs in another.
? cubs in all.



2. 16 light bulbs.
7 are broken.
? are not broken.



3. 15 pencils.
8 have erasers.
? do not have erasers.



4. 9 nut cookies.
7 sugar cookies.
? cookies in all.



Copy. Replace ● with $<$, $=$, or $>$.

- | | | |
|-------------------------|-------------------------|-------------------------|
| *5. $27 + 3 \bullet 30$ | 6. $27 + 4 \bullet 30$ | 7. $27 + 2 \bullet 30$ |
| 8. $47 + 3 \bullet 50$ | 9. $47 + 4 \bullet 50$ | 10. $47 + 2 \bullet 50$ |
| 11. $87 + 3 \bullet 90$ | 12. $87 + 8 \bullet 90$ | 13. $87 + 7 \bullet 90$ |
| 14. $67 + 3 \bullet 70$ | 15. $67 + 7 \bullet 70$ | 16. $67 + 9 \bullet 70$ |

Show the tens that each sum is in.

Example: $27 + 4$ Answer: 30's

- | | | | |
|--------------|--------------|--------------|--------------|
| 17. $27 + 6$ | 18. $17 + 8$ | 19. $57 + 9$ | 20. $87 + 6$ |
| 21. $47 + 8$ | 22. $57 + 3$ | 23. $77 + 5$ | 24. $67 + 9$ |

Name the number of tens in the answer. The number of ones is shown.

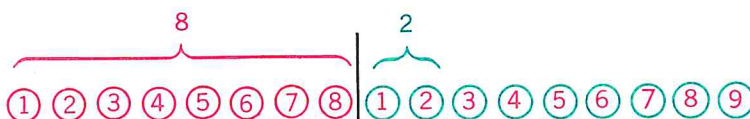
- | | |
|--------------------------------------|-------------------------------------|
| *25. $7 + 5 = 12$, so $27 + 5 = ?2$ | 26. $7 + 4 = 11$, so $27 + 4 = ?1$ |
| 27. $7 + 6 = 13$, so $27 + 6 = ?3$ | 28. $7 + 9 = 16$, so $27 + 9 = ?6$ |
| 29. $7 + 8 = 15$, so $67 + 8 = ?5$ | 30. $7 + 2 = 9$, so $47 + 2 = ?9$ |

FACTS WITH ONE ADDEND OF 8 OR LESS

- A.** Davy is 8 years old. In how many more years will he be old enough to deliver papers?

- To answer the question, find n .

$$8 + n = 10$$



- B.** To find the sum of 8 and 6, you can think:

- 8 and 2 from the 6 is 10.
- 10 and the 4 more from the 6 is 14.
- Think this way to find n .

$$\begin{aligned} 8 + 5 &= (8 + 2) + n & 8 + 7 &= (8 + 2) + n \\ 8 + 9 &= (8 + 2) + n & 8 + 8 &= (8 + 2) + n \end{aligned}$$

- C.** Tell how you think to solve each sentence.

$$\begin{array}{llll} 8 + 3 = n & 8 + 4 = n & 8 + 5 = n & 8 + 6 = n \\ 8 + 7 = n & 8 + 8 = n & 8 + 9 = n & 8 + 10 = n \end{array}$$

- D.** Use doubles to help you solve these sentences.

- $8 + 8 = 16$, so $8 + 9 = n$
- $8 + 8 = 16$, so $8 + 7 = n$

- E.** Write four facts for each number family.

$$\{8, 7, 15\} \qquad \{8, 9, 17\} \qquad \{8, 6, 14\}$$

- Why are there only two facts when both addends are 8 and the sum is 16?

EXERCISES

Solve.

*1. $8 + 2 = n$

2. $8 + 4 = n$

3. $8 + 0 = n$

4. $8 + 3 = n$

5. $8 + 5 = n$

6. $8 + 9 = n$

*7. $16 - 8 = n$

8. $14 - 8 = n$

9. $15 - 8 = n$

Find the missing addend.

*10. $\{8, \underline{\quad}, 11\}$

11. $\{8, \underline{\quad}, 15\}$

12. $\{8, \underline{\quad}, 13\}$

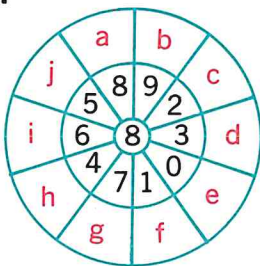
13. $\{8, \underline{\quad}, 14\}$

14. $\{8, \underline{\quad}, 12\}$

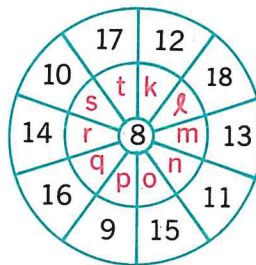
15. $\{8, \underline{\quad}, 17\}$

The two inside rings are for addends. The outside ring is for a sum. Replace each letter with the correct addend or sum.

16.



17.



Find the answer.

*18. $\begin{array}{r} 8 \\ +9 \\ \hline \end{array}$ 19. $\begin{array}{r} 8 \\ +7 \\ \hline \end{array}$ 20. $\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$ 21. $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$ 22. $\begin{array}{r} 8 \\ +6 \\ \hline \end{array}$ 23. $\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$

*24. $\begin{array}{r} 12 \\ -8 \\ \hline \end{array}$ 25. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ 26. $\begin{array}{r} 8 \\ -8 \\ \hline \end{array}$ 27. $\begin{array}{r} 15 \\ -8 \\ \hline \end{array}$ 28. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ 29. $\begin{array}{r} 16 \\ -8 \\ \hline \end{array}$

Think Twice

What has been done to each number named in column A to get the number named in column B?

30.

A	B
6	10
8	12

31.

A	B
9	4
13	8

32.

A	B
7	15
11	19

* 1. 10 7. 8 10. 3 18. 17 24. 4

USING THE FACTS



A. Chris has 8¢. She earns 5¢ more.

How much money does she have in all?

- 8 cents and 5 cents is how many cents?

$$8 + 5 = n$$

B. Frank has 8¢. He needs 15¢ to buy an ice cream cone.

How much more money does he need?

- 8 cents and how many more cents is 15 cents?

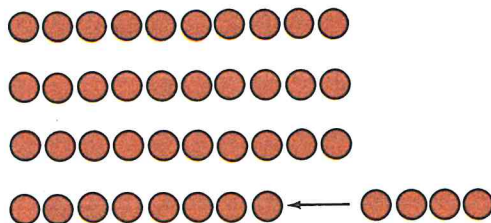
$$8 + n = 15$$

- Why can you also use this sentence?

$$15 - 8 = n$$

C. Laurie has 38 pennies in her bank. She puts in 4 more pennies.

- Does she have as much as 40¢ now? Does she have more than 40¢?



D. What number added to 38 is 40?

$$38 + n = 40$$

- If you add more than 2 to 38, is the sum greater than, equal to, or less than 40?

- Which sums are in the 40's?

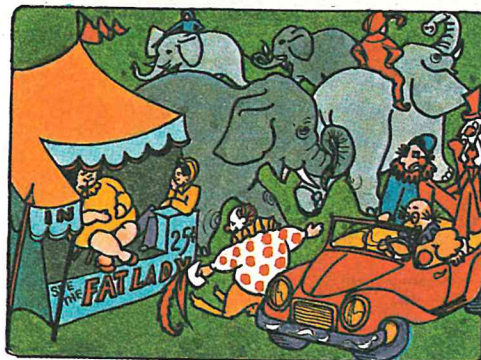
$38 + 8$	$38 + 6$	$38 + 1$	$38 + 2$	$38 + 9$
$38 + 3$	$38 + 5$	$38 + 0$	$38 + 4$	$38 + 7$



EXERCISES

Write only the answer to the problem.

- * 1. 17 clowns in a car.
9 get out.
? are still in the car.
2. 14 elephants.
Only 6 had riders.
? did not.
3. Side-show tickets 15¢.
You have 8¢.
You need ?¢ more.



Can you use these coins to pay for a 17¢ banner? Write Yes or No.

- * 4. 1 dime 7 pennies.
5. 2 nickels 7 pennies.
6. 17 pennies.
7. 3 nickels 2 pennies.
8. 1 nickel 12 pennies.
9. 2 nickels 4 pennies.

Replace ● with <, =, or >.

- | | | |
|--------------------------|-------------------------|-------------------------|
| *10. $58 + 2 \bullet 60$ | 11. $58 + 3 \bullet 60$ | 12. $58 + 4 \bullet 60$ |
| 13. $48 + 2 \bullet 50$ | 14. $48 + 5 \bullet 50$ | 15. $48 + 7 \bullet 50$ |
| 16. $68 + 5 \bullet 70$ | 17. $68 + 1 \bullet 70$ | 18. $68 + 7 \bullet 70$ |

Name the number of tens in the sum. The number of ones is shown.

- | | |
|--------------------------------------|-------------------------------------|
| *19. $8 + 8 = 16$, so $58 + 8 = ?6$ | 20. $8 + 9 = 17$, so $38 + 9 = ?7$ |
| 21. $8 + 7 = 15$, so $38 + 7 = ?5$ | 22. $6 + 8 = 14$, so $86 + 8 = ?4$ |

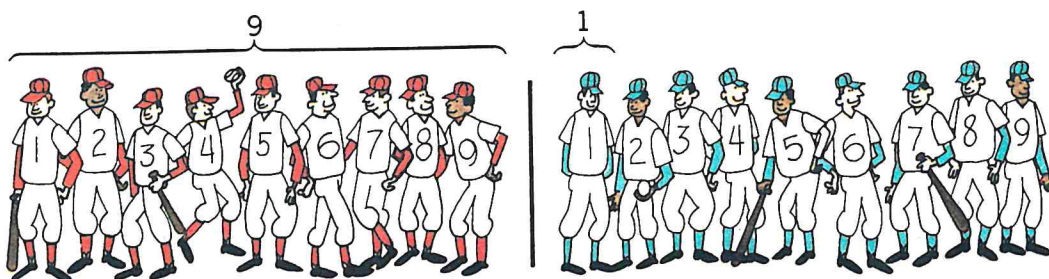
Keeping Up with the Facts

- | | | | | | |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$ | 2. $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$ | 3. $\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$ | 4. $\begin{array}{r} 2 \\ +0 \\ \hline \end{array}$ | 5. $\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$ | 6. $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$ |
|---|---|---|---|---|---|

- | | | |
|------------------|------------------|------------------|
| 7. $8 - 3 = n$ | 8. $6 - 2 = n$ | 9. $5 - 4 = n$ |
| 10. $11 - 5 = n$ | 11. $14 - 6 = n$ | 12. $12 - 9 = n$ |

-
- * 1. 8 4. Yes. 10. = 19. 6

ONE MORE FACT



- A.** Each baseball team has 9 players.
How many players are there on two teams?

- Solve this sentence.

$$9 + 9 = n$$

- B.** How is Tom thinking to add 9 and 9?

- How would you think to add 9 and 9?



9 and 1 from the other 9 is 10. 10 and the 8 more from the other 9 is 18.

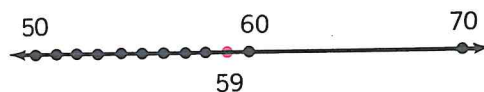
- C.** Tom and some of his friends want to play stickball.
They want 18 boys for a game. There are 9 boys ready to play. How many more do they need for a game?

- 9 and what number is 18? $9 + n = 18$
- Why can you also use this sentence? $18 - 9 = n$

- D.** What number added to 59 is 60?

$$59 + n = 60$$

- If you add more than 1 to 59, is the sum greater than, equal to, or less than 60?
- Which sums are in the 60's?



$59 + 0$	$59 + 3$	$59 + 5$	$59 + 9$	$59 + 2$
$59 + 1$	$59 + 7$	$59 + 8$	$59 + 6$	$59 + 4$

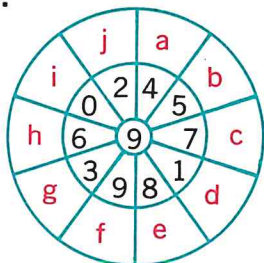
EXERCISES

Write only the answer to the problem.

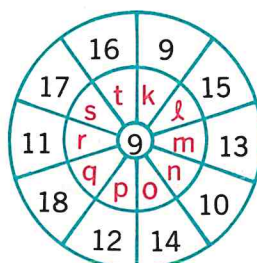
- *1. One baseball game is 9 innings. Two games are ? innings.
 2. 18 runs in two games. 9 runs in the first game.
 ? runs in the second game.

The two inside rings are for addends. The outside ring is for a sum. Replace each letter with the correct addend or sum.

3.



4.



Replace ● with <, =, or >.

- *5. $39 + 3$ ● 40 6. $59 + 5$ ● 60 7. $59 + 0$ ● 60
 8. $69 + 9$ ● 80 9. $49 + 9$ ● 50 10. $79 + 9$ ● 70

Name the number of tens in the sum. The number of ones is shown.

- *11. $9 + 9 = 18$, so $59 + 9 = ?8$ 12. $9 + 8 = 17$, so $59 + 8 = ?7$
 13. $39 + 9 = ?8$ 14. $49 + 9 = ?8$ 15. $79 + 9 = ?8$

Think Twice

What has been done to each number named in column A to get the number named in column B? Copy and complete each chart.

16.

A	B
2	4
5	7
9	11
11	<u> ? </u>

17.

A	B
4	2
7	5
9	7
12	<u> ? </u>

18.

A	B
2	4
3	6
4	8
5	<u> ? </u>

* 1. 18 5. > 11. 6

Write the answers only.

Write the answers only.

64

Write the answers only.

Write the answers only.

65

USING THE HUNDREDS CHART

A. Point to 5 on the chart.

Count 7 more. You are now pointing to ?.

$$5 + 7 = n$$

B. Use the chart.

Count 7 more than:

15; 25; 35; 45; 55; 65; 75.

C. Solve these sentences.

Use this fact. $5 + 7 = 12$

$$15 + 7 = \underline{\quad ? \quad}$$

$$25 + 7 = \underline{\quad ? \quad}$$

$$35 + 7 = \underline{\quad ? \quad}$$

$$45 + 7 = \underline{\quad ? \quad}$$

$$55 + 7 = \underline{\quad ? \quad}$$

$$75 + 7 = \underline{\quad ? \quad}$$

D. When 5 is in the ones place,

■ adding 7 gives ? in the ones place.

■ adding 7 makes ? more ten.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

EXERCISES

Use the given fact to find the sums.

*1. $6 + 6 = 12$

$$16 + 6 = \underline{\quad ? \quad}$$

$$26 + 6 = \underline{\quad ? \quad}$$

$$36 + 6 = \underline{\quad ? \quad}$$

2. $5 + 4 = 9$

$$15 + 4 = \underline{\quad ? \quad}$$

$$25 + 4 = \underline{\quad ? \quad}$$

$$75 + 4 = \underline{\quad ? \quad}$$

3. $8 + 6 = 14$

$$18 + 6 = \underline{\quad ? \quad}$$

$$28 + 6 = \underline{\quad ? \quad}$$

$$48 + 6 = \underline{\quad ? \quad}$$

4. $7 + 8 = 15$

$$17 + 8 = \underline{\quad ? \quad}$$

$$27 + 8 = \underline{\quad ? \quad}$$

$$67 + 8 = \underline{\quad ? \quad}$$

5. $8 + 5 = 13$

$$18 + 5 = \underline{\quad ? \quad}$$

$$28 + 5 = \underline{\quad ? \quad}$$

$$58 + 5 = \underline{\quad ? \quad}$$

Write each sum.

*6. $9 + 8 = \underline{\quad ? \quad}$

$$19 + 8 = \underline{\quad ? \quad}$$

$$29 + 8 = \underline{\quad ? \quad}$$

$$49 + 8 = \underline{\quad ? \quad}$$

7. $4 + 3 = \underline{\quad ? \quad}$

$$14 + 3 = \underline{\quad ? \quad}$$

$$24 + 3 = \underline{\quad ? \quad}$$

$$74 + 3 = \underline{\quad ? \quad}$$

8. $5 + 5 = \underline{\quad ? \quad}$

$$15 + 5 = \underline{\quad ? \quad}$$

$$25 + 5 = \underline{\quad ? \quad}$$

$$85 + 5 = \underline{\quad ? \quad}$$

* 1. 22; 32; 42 6. 17; 27; 37; 57

Solve.

- | | | | |
|---|--------------------------------------|--------------------------------------|--------------------------------------|
| 9. $9 + 9 = \underline{\quad ? \quad}$ | 19 + 9 = $\underline{\quad ? \quad}$ | 29 + 9 = $\underline{\quad ? \quad}$ | 89 + 9 = $\underline{\quad ? \quad}$ |
| 10. $8 + 8 = \underline{\quad ? \quad}$ | 18 + 8 = $\underline{\quad ? \quad}$ | 28 + 8 = $\underline{\quad ? \quad}$ | 38 + 8 = $\underline{\quad ? \quad}$ |
| 11. $7 + 7 = \underline{\quad ? \quad}$ | 17 + 7 = $\underline{\quad ? \quad}$ | 27 + 7 = $\underline{\quad ? \quad}$ | 67 + 7 = $\underline{\quad ? \quad}$ |
| 12. $7 + 6 = \underline{\quad ? \quad}$ | 17 + 6 = $\underline{\quad ? \quad}$ | 27 + 6 = $\underline{\quad ? \quad}$ | 77 + 6 = $\underline{\quad ? \quad}$ |

Copy and complete each example.

- | | | | | | |
|--|--|--|--|--|--|
| 13. 35 | 14. 86 | 15. 48 | 16. 62 | 17. 84 | 18. 37 |
| $\begin{array}{r} +9 \\ \hline 4? \end{array}$ | $\begin{array}{r} +9 \\ \hline 9? \end{array}$ | $\begin{array}{r} +9 \\ \hline 5? \end{array}$ | $\begin{array}{r} +9 \\ \hline ?1 \end{array}$ | $\begin{array}{r} +8 \\ \hline ?2 \end{array}$ | $\begin{array}{r} +9 \\ \hline ?6 \end{array}$ |

Write the sums only.

- | | |
|---|--|
| *19. $5 + 4 = \underline{\quad ? \quad}$
$15 + 4 = \underline{\quad ? \quad}$
15 tens + 4 tens = $\underline{\quad ? \quad}$ tens | 20. $7 + 8 = \underline{\quad ? \quad}$
$27 + 8 = \underline{\quad ? \quad}$
27 tens + 8 tens = $\underline{\quad ? \quad}$ tens |
| 21. $9 + 8 = \underline{\quad ? \quad}$
$39 + 8 = \underline{\quad ? \quad}$
39 tens + 8 tens = $\underline{\quad ? \quad}$ tens | 22. $8 + 8 = \underline{\quad ? \quad}$
$58 + 8 = \underline{\quad ? \quad}$
58 tens + 8 tens = $\underline{\quad ? \quad}$ tens |
| 23. $7 + 6 = \underline{\quad ? \quad}$
$37 + 6 = \underline{\quad ? \quad}$
37 tens + 6 tens = $\underline{\quad ? \quad}$ tens | 24. $9 + 9 = \underline{\quad ? \quad}$
$59 + 9 = \underline{\quad ? \quad}$
59 tens + 9 tens = $\underline{\quad ? \quad}$ tens |

Use the chart to answer the following questions.

25. What number does \mathcal{O} name?
26. How many \cap 's make one \mathcal{O} ?
27. What numbers are missing in the chart?
28. $\mathcal{O}\cap\cap\cap$ names $\underline{\quad ? \quad}$ tens altogether.
130 names $\underline{\quad ? \quad}$ tens altogether.

$\cap = 10$
 $\mathcal{O} = \cap\cap\cap\cap\cap\cap\cap\cap\cap\cap$
1 hundred = $\underline{\quad ? \quad}$ tens
100 = $\underline{\quad ? \quad}$ tens

- | | | |
|---|--|--|
| *29. $170 = \underline{\quad ? \quad}$ tens | 30. $300 = \underline{\quad ? \quad}$ tens | 31. $320 = \underline{\quad ? \quad}$ tens |
| 32. $460 = \underline{\quad ? \quad}$ tens | 33. $870 = \underline{\quad ? \quad}$ tens | 34. $670 = \underline{\quad ? \quad}$ tens |
| 35. $830 = \underline{\quad ? \quad}$ tens | 36. $900 = \underline{\quad ? \quad}$ tens | 37. $990 = \underline{\quad ? \quad}$ tens |

* 19. 9; 19; 19 tens. 29. 17

RENAMING ONES AS TENS IN ADDITION

A. There are 29 boys and 44 girls at a party.

Mary is to find how many are there in all.

$$\begin{array}{r} 29 \\ + 44 \\ \hline \end{array}$$

■ She estimated the sum. $30 + 40 = ?$

B. Then Mary thought:



$9 + 4 = 13$
Name 13 as 1 ten 3 ones.
I write 3 in the ones place.

$$\begin{array}{r} 1 \\ 29 \\ + 44 \\ \hline 3 \end{array}$$

■ Where did she write a 1 to remind her of the 1 ten in 13?

C. Then she thought:



I'll add the 1 ten to 2 tens.
 $1 + 2 = 3$ so,
1 ten + 2 tens = 3 tens.

$$\begin{array}{r} 1 \\ 29 \\ + 44 \\ \hline 73 \end{array}$$

■ Mary then added the 3 tens to 4 tens.

In what place did she write a 7? Why?

■ How many were at the party? $29 + 44 = ?$

D. You can add 37 and 58 in the same way.

$$\begin{array}{r} 1 \\ 37 \\ + 58 \\ \hline 5 \end{array}$$



$$\begin{array}{r} 1 \\ 37 \\ + 58 \\ \hline 95 \end{array}$$

Add the ones. $7 + 8 = ?$
Name 15 as 1 ten ? ones.
Write 5 in the ones place.
Write 1 to remember 1 ten.

Add the tens.
 $1 + 3 + 5 = ?$
Write 9 in the tens place.
 $37 + 58 = ?$

EXERCISES

One digit in the answer is missing. What is the answer?

¹ *1. $\begin{array}{r} 22 \\ +49 \\ \hline 7? \end{array}$	¹ 2. $\begin{array}{r} 65 \\ +28 \\ \hline 9? \end{array}$	¹ 3. $\begin{array}{r} 39 \\ +24 \\ \hline 6? \end{array}$	¹ 4. $\begin{array}{r} 38 \\ +36 \\ \hline 7? \end{array}$	5. $\begin{array}{r} 75 \\ +14 \\ \hline 8? \end{array}$	¹ 6. $\begin{array}{r} 78 \\ +47 \\ \hline 12? \end{array}$
---	--	--	--	--	---

¹ 7. $\begin{array}{r} 66 \\ +29 \\ \hline ?5 \end{array}$	¹ 8. $\begin{array}{r} 78 \\ +19 \\ \hline ?7 \end{array}$	¹ 9. $\begin{array}{r} 78 \\ +13 \\ \hline ?1 \end{array}$	10. $\begin{array}{r} 47 \\ +12 \\ \hline ?9 \end{array}$	¹ 11. $\begin{array}{r} 63 \\ +29 \\ \hline ?2 \end{array}$	¹ 12. $\begin{array}{r} 75 \\ +19 \\ \hline ?4 \end{array}$
--	--	--	---	---	---

Find the sum.

*13. $\begin{array}{r} 46 \\ +35 \\ \hline \end{array}$	14. $\begin{array}{r} 56 \\ +39 \\ \hline \end{array}$	15. $\begin{array}{r} 37 \\ +48 \\ \hline \end{array}$	16. $\begin{array}{r} 43 \\ +32 \\ \hline \end{array}$	17. $\begin{array}{r} 58 \\ +39 \\ \hline \end{array}$	18. $\begin{array}{r} 47 \\ +75 \\ \hline \end{array}$
19. $\begin{array}{r} 37 \\ +62 \\ \hline \end{array}$	20. $\begin{array}{r} 36 \\ +46 \\ \hline \end{array}$	21. $\begin{array}{r} 77 \\ +14 \\ \hline \end{array}$	22. $\begin{array}{r} 99 \\ +15 \\ \hline \end{array}$	23. $\begin{array}{r} 69 \\ +38 \\ \hline \end{array}$	24. $\begin{array}{r} 54 \\ +46 \\ \hline \end{array}$

Use the sum in **a** to help you find the sum in **b**.

*25. a. $\begin{array}{r} 47 \\ +18 \\ \hline 65 \end{array}$	b. $\begin{array}{r} 247 \\ +318 \\ \hline 5?? \end{array}$	26. a. $\begin{array}{r} 67 \\ +15 \\ \hline 82 \end{array}$	b. $\begin{array}{r} 167 \\ +215 \\ \hline ??? \end{array}$	27. a. $\begin{array}{r} 74 \\ +18 \\ \hline 92 \end{array}$	b. $\begin{array}{r} 274 \\ +118 \\ \hline ??? \end{array}$
---	---	--	---	--	---

Find the sum.

*28. $\begin{array}{r} 349 \\ +128 \\ \hline \end{array}$	29. $\begin{array}{r} 476 \\ +119 \\ \hline \end{array}$	30. $\begin{array}{r} 777 \\ +214 \\ \hline \end{array}$	31. $\begin{array}{r} 666 \\ +123 \\ \hline \end{array}$	32. $\begin{array}{r} 185 \\ +637 \\ \hline \end{array}$	33. $\begin{array}{r} 978 \\ +33 \\ \hline \end{array}$
---	--	--	--	--	---

Think Twice

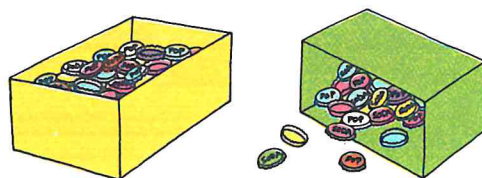
34. $\begin{array}{r} 3429 \\ +1235 \\ \hline \end{array}$

35. $\begin{array}{r} 53,437 \\ +12,140 \\ \hline \end{array}$

36. $\begin{array}{r} 900000000 \\ +99000000 \\ \hline \end{array}$

RENAMING TENS AS HUNDREDS IN ADDITION

- A.** Jim collects bottle caps.
He has 246 caps in one box.
He has 372 caps in another.
You are to find how many he has altogether.



- Estimate. $200 + 400 = ?$

- B.** Here are three ways to name the sum of 246 and 372.

a. $\overset{1 \text{ hundred}}{\leftarrow}$

2 hundreds	4 tens 6 ones
+ 3 hundreds	7 tens 2 ones
6 hundreds	$\textcircled{1}$ 1 ten 8 ones

b. $\overset{100}{\leftarrow}$

200 +	40 + 6
+ 300 +	70 + 2
600 +	$\textcircled{1}$ 10 + 8

c. $\overset{1}{\leftarrow}$

246
+ 372
618

- In **a**, $4 \text{ tens} + 7 \text{ tens} = ? \text{ tens}$. How was 11 tens renamed?
Where is 1 ten shown? Where is 1 hundred shown?
How do you get 6 hundreds?
- How was the renaming done in **b**?
- How is **c** like **a** and **b**? How is it different?

- ✓ Use each of the three ways to find the sum of 135 and 390.

1 hundred	3 tens 5 ones
+ 3 hundreds	9 tens 0 ones
? hundreds	? tens ? ones

100 +	30 + 5	135
+ 300 +	90 + 0	+ 390
??? +	?? + ?	???

EXERCISES

Rename each as tens and ones.

- * 1. 15 ones. 2. 18 ones. 3. 13 ones. 4. 10 ones. 5. 14 ones.

Rename each as hundreds and tens.

- * 6. 11 tens. 7. 16 tens. 8. 12 tens. 9. 17 tens. 10. 19 tens.

- * 1. 1 ten 5 ones. 6. 1 hundred 1 ten.

Write the missing digit in each answer.

<p>*11. 2 hundreds 6 tens 4 ones $\begin{array}{r} + 2 \text{ hundreds} \\ \hline 5 \text{ hundreds} \end{array}$? tens 4 ones</p>	<p>12. $300 + 30 + 7$ $\begin{array}{r} + 400 + 90 + 2 \\ \hline 800 + ?0 + 9 \end{array}$</p>	<p>13. 364 $\begin{array}{r} + 192 \\ \hline 5?6 \end{array}$</p>
---	--	--

<p>*14. 243 $\begin{array}{r} + 185 \\ \hline 4?8 \end{array}$</p>	<p>15. 445 $\begin{array}{r} + 74 \\ \hline 5?9 \end{array}$</p>	<p>16. 473 $\begin{array}{r} + 283 \\ \hline ?56 \end{array}$</p>	<p>17. 370 $\begin{array}{r} + 294 \\ \hline ?64 \end{array}$</p>	<p>18. 356 $\begin{array}{r} + 192 \\ \hline 5?8 \end{array}$</p>
---	---	--	--	--

<p>19. 594 $\begin{array}{r} + 160 \\ \hline 7?? \end{array}$</p>	<p>20. 563 $\begin{array}{r} + 375 \\ \hline 9?? \end{array}$</p>	<p>21. 565 $\begin{array}{r} + 52 \\ \hline ??? \end{array}$</p>	<p>22. 472 $\begin{array}{r} + 222 \\ \hline ??? \end{array}$</p>	<p>23. 534 $\begin{array}{r} + 383 \\ \hline ??? \end{array}$</p>
--	--	---	--	--

24. $653 + 196 = ???$ **25.** $765 + 184 = ???$ **26.** $124 + 84 = ???$

Find the sum.

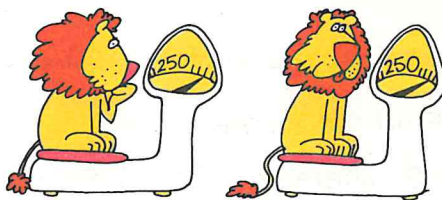
<p>*27. 264 $\begin{array}{r} + 153 \\ \hline \end{array}$</p>	<p>28. 265 $\begin{array}{r} + 193 \\ \hline \end{array}$</p>	<p>29. 173 $\begin{array}{r} + 284 \\ \hline \end{array}$</p>	<p>30. 234 $\begin{array}{r} + 123 \\ \hline \end{array}$</p>	<p>31. 185 $\begin{array}{r} + 593 \\ \hline \end{array}$</p>
---	--	--	--	--

<p>32. 226 $\begin{array}{r} + 153 \\ \hline \end{array}$</p>	<p>33. 273 $\begin{array}{r} + 773 \\ \hline \end{array}$</p>	<p>34. 777 $\begin{array}{r} + 142 \\ \hline \end{array}$</p>	<p>35. 299 $\begin{array}{r} + 140 \\ \hline \end{array}$</p>	<p>36. 182 $\begin{array}{r} + 423 \\ \hline \end{array}$</p>
--	--	--	--	--

<p>37. 542 $\begin{array}{r} + 205 \\ \hline \end{array}$</p>	<p>38. 431 $\begin{array}{r} + 175 \\ \hline \end{array}$</p>	<p>39. 137 $\begin{array}{r} + 870 \\ \hline \end{array}$</p>	<p>40. 174 $\begin{array}{r} + 795 \\ \hline \end{array}$</p>	<p>41. 320 $\begin{array}{r} + 391 \\ \hline \end{array}$</p>
--	--	--	--	--

Find the answer.

42. How much do these two lions weigh altogether?

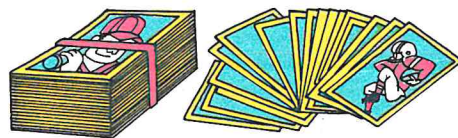


43. It is 473 miles from your house to your grandmother's house. How many miles there and back?

RENAMING TWICE IN ADDITION

- A.** Jeff has 549 baseball cards.
He has 378 football cards.

- Does he have about 800, 900, or 1000 cards in all?



- B.** You can name the sum of 549 and 378 in three ways.

a.

$$\begin{array}{r}
 \begin{array}{ccc}
 \text{1 hundred} \leftarrow & \text{1 ten} \leftarrow & \\
 5 \text{ hundreds} & 4 \text{ tens} & 9 \text{ ones} \\
 + 3 \text{ hundreds} & 7 \text{ tens} & 8 \text{ ones} \\
 \hline
 9 \text{ hundreds} & \textcircled{i} 2 \text{ tens} & \textcircled{i} 7 \text{ ones}
 \end{array}
 \end{array}$$

b.

$$\begin{array}{r}
 \begin{array}{ccc}
 100 \leftarrow & 10 \leftarrow & \\
 500 + & 40 + & 9 \\
 300 + & 70 + & 8 \\
 \hline
 900 + \textcircled{i} 20 + \textcircled{i} 7
 \end{array}
 \end{array}$$

c.

$$\begin{array}{r}
 \begin{array}{cc}
 1 & 1 \\
 549 & \\
 + 378 & \\
 \hline
 927 &
 \end{array}
 \end{array}$$

- How was 17 ones renamed in **a**? Where is 1 ten shown?
- How was 12 tens renamed in **a**? Where is 2 tens shown?
- Where is 1 hundred shown in **a**? How do you get 9 hundreds?

- C.** Tell how the renaming was done in **b**; in **c**.

EXERCISES

Find the sum.

$$\begin{array}{r}
 *1. \quad 64 \\
 + 87 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 2. \quad 249 \\
 + 163 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 3. \quad 835 \\
 + 89 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 4. \quad 57 \\
 + 78 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 5. \quad 148 \\
 + 475 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 6. \quad 386 \\
 + 245 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 7. \quad 89 \\
 + 43 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 8. \quad 467 \\
 + 446 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 9. \quad 456 \\
 + 284 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 10. \quad 157 \\
 + 386 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 11. \quad 439 \\
 + 273 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 12. \quad 357 \\
 + 463 \\
 \hline
 \end{array}$$

$$13. \quad 597 + 285 = \underline{\quad} \quad
 14. \quad 647 + 789 = \underline{\quad} \quad
 15. \quad 423 + 198 = \underline{\quad}$$

Find the answer.

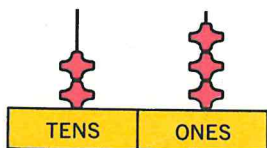
- 16.** There are 235 bricks in one pile. There are 356 bricks in another. How many bricks are in both piles?
- 17.** There are 256 cattle in one herd and 175 in another. How many cattle are in both herds?

*1. 151

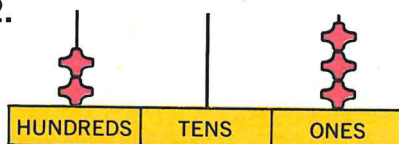
KEEPING UP IN MATHEMATICS

Write an Egyptian numeral for each. Then write a place-value numeral. [24-27]

1.



2.



Solve each sentence. [34-35, 44]

3. $18 + 25 = 43$, so

$25 + 18 = \square$

4. $63 + 0 = \square$

5. $14 + (\square + 51) =$
 $(14 + 26) + 51$

Give an approximation for the price of each toy. [37]

6.



7.



8.



9.



Is each sum odd or even? [16]

10. $\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$ 11. $\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$ 12. $\begin{array}{r} 4 \\ +1 \\ \hline \end{array}$

Copy and write the answer.

[32, 40, 42]

13. $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$ 14. $\begin{array}{r} 6 \\ +9 \\ \hline \end{array}$ 15. $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$

16. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ 17. $\begin{array}{r} 10 \\ -4 \\ \hline \end{array}$ 18. $\begin{array}{r} 6 \\ -0 \\ \hline \end{array}$

19. $\begin{array}{r} 20 \\ +50 \\ \hline \end{array}$ 20. $\begin{array}{r} 30 \\ +40 \\ \hline \end{array}$ 21. $\begin{array}{r} 60 \\ +10 \\ \hline \end{array}$

22. $\begin{array}{r} 500 \\ +300 \\ \hline \end{array}$ 23. $\begin{array}{r} 200 \\ +400 \\ \hline \end{array}$ 24. $\begin{array}{r} 100 \\ +700 \\ \hline \end{array}$

25. $\begin{array}{r} 90 \\ -30 \\ \hline \end{array}$ 26. $\begin{array}{r} 50 \\ -40 \\ \hline \end{array}$ 27. $\begin{array}{r} 80 \\ -20 \\ \hline \end{array}$

28. $\begin{array}{r} 700 \\ -500 \\ \hline \end{array}$ 29. $\begin{array}{r} 600 \\ -300 \\ \hline \end{array}$ 30. $\begin{array}{r} 300 \\ -200 \\ \hline \end{array}$

31. $\begin{array}{r} 47 \\ +12 \\ \hline \end{array}$ 32. $\begin{array}{r} 63 \\ +25 \\ \hline \end{array}$ 33. $\begin{array}{r} 36 \\ +51 \\ \hline \end{array}$

34. $\begin{array}{r} 463 \\ +324 \\ \hline \end{array}$ 35. $\begin{array}{r} 751 \\ +217 \\ \hline \end{array}$ 36. $\begin{array}{r} 649 \\ +150 \\ \hline \end{array}$

37. $\begin{array}{r} 58 \\ -23 \\ \hline \end{array}$ 38. $\begin{array}{r} 99 \\ -47 \\ \hline \end{array}$ 39. $\begin{array}{r} 76 \\ -35 \\ \hline \end{array}$

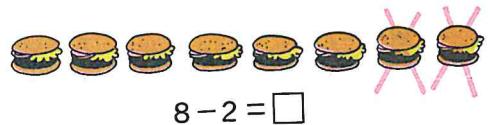
40. $\begin{array}{r} 528 \\ -416 \\ \hline \end{array}$ 41. $\begin{array}{r} 395 \\ -273 \\ \hline \end{array}$ 42. $\begin{array}{r} 672 \\ -520 \\ \hline \end{array}$

SUBTRACTION PROBLEMS

Subtraction can be used to solve many types of problems.

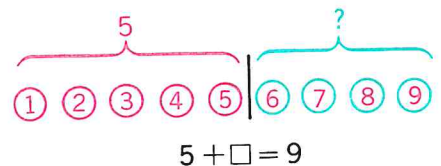
- A.** Mother made 8 hamburgers.
James had 2 hamburgers.

■ How many hamburgers are left?



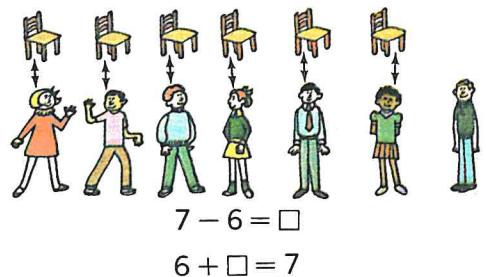
- B.** Lula has 5¢. She needs 9¢
for a bag of popcorn.

■ How much more does she need?



- C.** There are 6 chairs set up
for musical chairs. There
are 7 children playing.

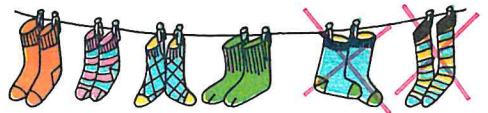
■ How many more children
than chairs are there?
■ How many fewer chairs
than children are there?



EXERCISES

Write a number sentence to solve these subtraction and addition problems. Then write the answer.

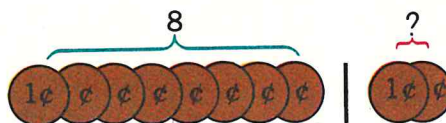
1. Betty had 12 socks on the clothesline. She took off 4 socks. How many were left on the line?



2. There were 10 boxes of cereal. Mother used 4 boxes. How many are left?

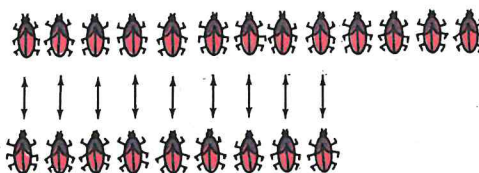


Find the answer.

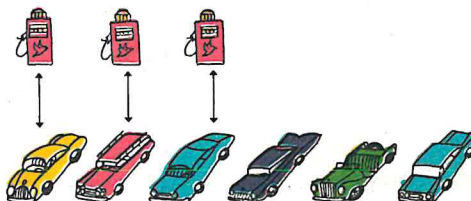


3. Fred has 8¢. A soda costs 10¢.
How much more money does he need?

4. Booker caught 13 fireflies.
Emmett caught 9 fireflies.
How many more did Booker catch
than Emmett? How many fewer
did Emmett catch than Booker?



5. There are 3 gas pumps at the
station. There are 6 cars
waiting for gas. How many more
cars than pumps are there?
How many fewer pumps than
cars are there?



6. Katie bought 3 records.
She had 9 records at home.
How many does she have now?



7. A used-car dealer had 9 hard tops and 15 convertibles for sale.
How many more convertibles than hard tops are there?
How many fewer hard tops than convertibles are there?
8. Dave put 6¢ in his bank. He already had 7¢ in his bank.
How much money does he have in it now?

Think Twice

9. Joan made 14 sandwiches. She made 6 cheese sandwiches.
The rest were tuna fish. Of which kind did she have
more? How many more?

CHECKPOINT

✓ Check your understanding of **key terms and phrases**.

Use each in a sentence.

number family addend double rename sum

✓ Check your understanding of **key ideas**.

1a. What added to 7 is 10?

What added to 8 is 10?

What added to 9 is 10?

1b. 7	8	9
<u>+5</u>	<u>+7</u>	<u>+9</u>

2a. What must you add to 67 to have a sum in the 70's?

2b. Which sums are in the 70's.
 $67 + 1$ $67 + 8$ $67 + 3$

3a. A ten is how many ones?
 A hundred is how many tens?

3b. Rename each.
 $7 \text{ ones} + 6 \text{ ones} = 1 \text{ ten } \underline{\hspace{1cm}} \text{ ones}$
 $8 \text{ tens} + 5 \text{ tens} =$
 1 hundred $\underline{\hspace{1cm}}$ ones

✓ Check your **skills**.

- | | | |
|-------------------------|-------------------------|-------------------------|
| 1. $7 + 5 = n$ | 2. $8 + 3 = n$ | 3. $9 + 4 = n$ |
| 4. $6 + 8 = n$ | 5. $8 + 7 = n$ | 6. $7 + 6 = n$ |
| 7. $16 - 8 = n$ | 8. $14 - 9 = n$ | 9. $18 - 9 = n$ |
| 10. $12 - 9 = n$ | 11. $17 - 8 = n$ | 12. $11 - 4 = n$ |
-
- | | | | | | |
|---------------|---------------|---------------|---------------|---------------|---------------|
| 13. 17 | 14. 28 | 15. 39 | 16. 47 | 17. 58 | 18. 69 |
| <u>+3</u> | <u>+6</u> | <u>+9</u> | <u>+4</u> | <u>+3</u> | <u>+2</u> |
-
- | | | | | | |
|---------------|---------------|---------------|---------------|---------------|----------------|
| 19. 36 | 20. 25 | 21. 35 | 22. 49 | 23. 69 | 24. 127 |
| <u>+27</u> | <u>+58</u> | <u>+15</u> | <u>+24</u> | <u>+13</u> | <u>+245</u> |
-
- | | | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 25. 471 | 26. 178 | 27. 764 | 28. 370 | 29. 154 | 30. 255 |
| <u>+593</u> | <u>+285</u> | <u>+179</u> | <u>+465</u> | <u>+239</u> | <u>+489</u> |

UNIT TEST

What number makes each sentence true?

1. $9 + 7 = \square$

2. $15 = 7 + \triangle$

3. $\square + \square = 18$

Find the answers.

4. Write two addition sentences and two subtraction sentences for this number family? $\{8, 5, 13\}$
5. Which sum is in the 50's, $47 + 2$ or $47 + 4$?
6. There are 17 blue pencils. There are 7 red pencils.
How many fewer blue pencils are there than red pencils?
7. Joey needs 12 nails to make a box. He found 9 nails.
How many more nails does he need?

Find the sums.

8.
$$\begin{array}{r} 157 \\ + 125 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 341 \\ + 190 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 486 \\ + 436 \\ \hline \end{array}$$

If you have time, try these.

Solve.

11. $39 + 47 = n + 39$

12. $53 + (n + 17) = (53 + 57) + 17$

MATHAMUSEMENTS

Find the sum.

- In each row.
- In each column.
- Along the red line.
- Along the blue line.

What do you notice?

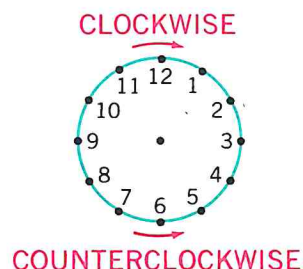
17	24	1	8	15
23	5	7	14	16
4	6	13	20	22
10	12	19	21	3
11	18	25	2	9

INQUIRY INTO NUMBER

Clock Arithmetic

Think of this clock as a number line wrapped around a circle.

- To compute on this clock, start at 12 and move *clockwise* (around the clock to the right).



ADDING ON THE CLOCK

The sentence $10 + 4 \stackrel{c}{=} \square$ means “10 plus 4 on the clock equals some number.” Try to find the number. If you cannot find it, read the following.

- Start at 12. Move 10 spaces clockwise.
- Move 4 more spaces clockwise. On what number do you stop?
- This sentence is true. $10 + 4 \stackrel{c}{=} 2$
- What number makes each sentence below true?

$$9 + 5 \stackrel{c}{=} \square \quad 3 + 5 \stackrel{c}{=} \square \quad 8 + 6 \stackrel{c}{=} \square$$

SUBTRACTING ON THE CLOCK

$3 - 8 \stackrel{c}{=} \square$ means, “3 minus 8 on the clock equals some number.”

$8 + \square \stackrel{c}{=} 3$ means, “8 plus some number on the clock is 3.”

Is $8 + \square \stackrel{c}{=} 3$ another way to think of $3 - 8 \stackrel{c}{=} \square$?

Try to solve both sentences on the clock.

If you cannot, read the following.

- Start at 12. Move 8 spaces clockwise.
- How many more spaces must you move clockwise to stop on 3?
- This sentence is true. $8 + 7 \stackrel{c}{=} 3$
- Is this sentence true? $3 - 8 \stackrel{c}{=} 7$

Now try these. Find the number that makes each sentence true. Use the clock on the opposite page.

$4 - 10 \stackrel{c}{=} \square$

$3 - 4 \stackrel{c}{=} \square$

$1 - 11 \stackrel{c}{=} \square$

COMMUTATIVE PROPERTY

When adding on the clock, do you think changing the order of addends would change the sum?

- Solve these pairs of sentences.

$4 + 10 \stackrel{c}{=} \square$

$1 + 12 \stackrel{c}{=} \square$

$6 + 8 \stackrel{c}{=} \square$

$10 + 4 \stackrel{c}{=} \square$

$12 + 1 \stackrel{c}{=} \square$

$8 + 6 \stackrel{c}{=} \square$

- In clock arithmetic is addition commutative?

In clock arithmetic, do you think subtraction is commutative?

- Solve these pairs of sentences to check your answer.

$12 - 5 \stackrel{c}{=} \square$

$3 - 4 \stackrel{c}{=} \square$

$8 - 6 \stackrel{c}{=} \square$

$5 - 12 \stackrel{c}{=} \square$

$4 - 3 \stackrel{c}{=} \square$

$6 - 8 \stackrel{c}{=} \square$

ASSOCIATIVE PROPERTY

When adding on the clock, do you think the way you group addends would affect the sum?

- Solve these sentences. Remember to do what is between parenthesis first.

$(6 + 3) + 5 \stackrel{c}{=} \square$

$(4 + 7) + 8 \stackrel{c}{=} \square$

$6 + (3 + 5) \stackrel{c}{=} \square$

$4 + (7 + 8) \stackrel{c}{=} \square$

- In clock arithmetic is addition associative?

For Further Inquiry

Now try these.

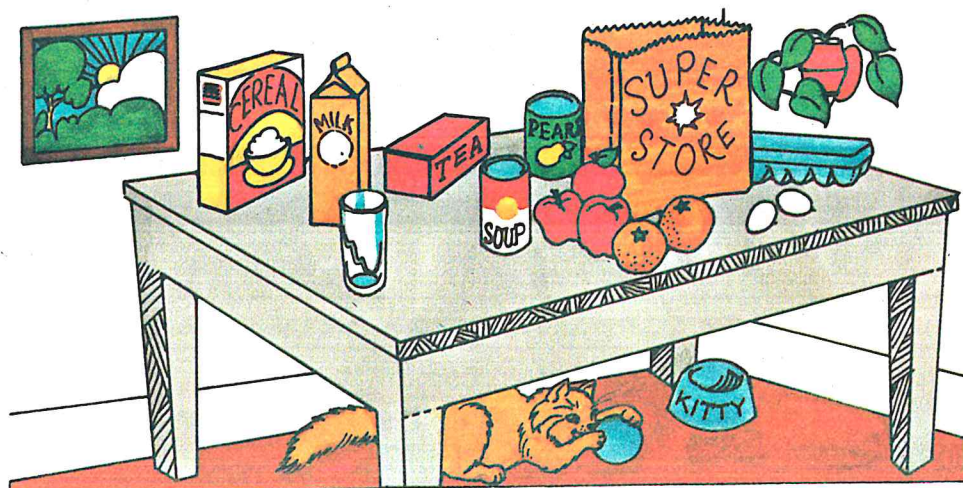
$(7 + 5) - 3 \stackrel{c}{=} \square$

$(8 - 5) + 4 \stackrel{c}{=} \square$

$(4 + 6) + \square \stackrel{c}{=} 2$

$\square + (8 + 5) \stackrel{c}{=} 7$

CLOSED SURFACES



A. Name some objects on the table.

- What shapes do you see?

B. What you can see and feel is on the **surface** of an object.

- What is *on* the surface of the soup can?
- What is *inside* the soup can? What is *outside* it?
- The surface of the soup can is a **closed surface**.

A closed surface encloses a part of space.

A closed surface has no holes in it.

C. Think of an exact location on the cereal box.

- You are thinking of a **point** in geometry.

A point has no size.

D. Think of all the points along one edge of the cereal box.

- You are thinking of something straight.
- You are thinking of a set of points called a **line segment**.

A line segment is part of a line.

EXERCISES

Does each object have at least one flat place? Write Yes or No.

- | | | |
|------------------|-----------------|--------------|
| *1. Rubber ball. | 2. Milk carton. | 3. Apple. |
| 4. Tea box. | 5. Table top. | 6. Soup can. |

Does the object make you think of a closed surface?

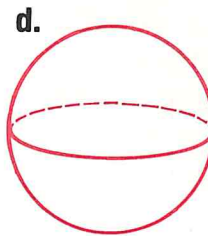
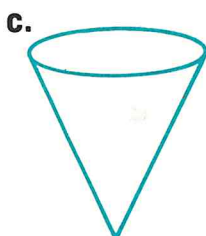
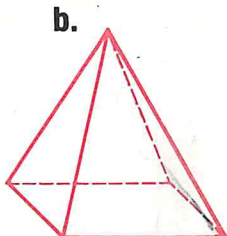
Write Yes or No.

- | | | |
|-------------------|-------------------|--------------------|
| *7. Kitty's dish. | 8. Orange. | 9. Drinking glass. |
| 10. Egg. | 11. Shopping bag. | 12. Pear can. |

Does the object have an edge that makes you think of a line segment? Write Yes or No.

- | | | |
|---------------------|------------------|---------------|
| *13. Tea box. | 14. Rubber ball. | 15. Soup can. |
| 16. Drinking glass. | 17. Cereal box. | 18. Egg. |

Use the figures below to do Ex. 19–21.



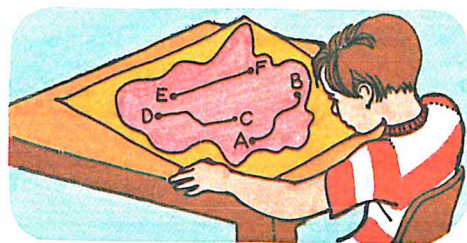
19. Which figures have flat places?
20. Which figures have an edge that is a line segment?
21. Which figures have surfaces that are closed surfaces?

Keeping Up with the Facts

- | | | | | | |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$ | 2. $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$ | 4. $\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$ | 5. $\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$ | 6. $\begin{array}{r} 9 \\ +3 \\ \hline \end{array}$ |
|---|---|---|---|---|---|

PLANES, PATHS, AND REGIONS

- A.** Pete is using a flat piece of art paper on his desk top. Think of the paper as extending on and on in all directions. You are thinking of a **plane**.

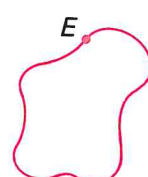
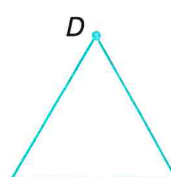
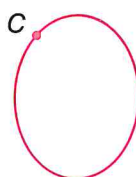
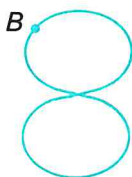
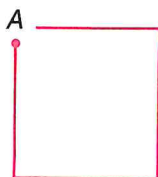


- A plane is a set of points.
A plane is a perfectly flat surface that goes on and on without end.
A plane has no edges, no thickness, and no holes in it.
- How did Pete name some of the points in the plane?

- B.** Pete drew three **paths** in the plane.

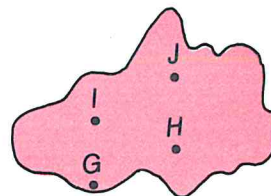
- What did he name the **endpoints** of each path?

- C.** Trace each path below with your finger.



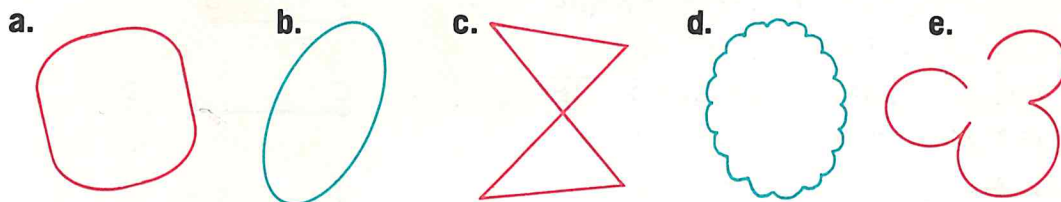
- On which paths did you come back to where you started?
These are **closed paths**.
- Which of the closed paths did not cross themselves?
These are **simple closed paths**.

- D.** Think of the set of points inside this closed path. Think of this set joined with the closed path. You are thinking of a **plane region**.



- Is a plane region flat? Is it part of a plane?

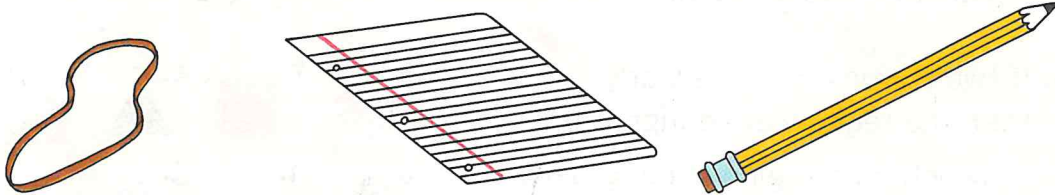
EXERCISES



- *1. Which of the figures above are closed paths?
2. Which of the closed paths are also simple closed paths?

Draw a simple closed path.

3. Mark 3 points inside the path. Name them *A*, *B*, and *C*.
4. Mark 3 points on the path. Name them *X*, *Y*, and *Z*.
5. Mark 3 points outside the path. Name them *M*, *N*, and *P*.



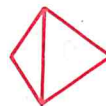
- *6. Which picture above makes you think of a closed path?
7. Which picture makes you think of a plane region?

Write *Yes* or *No* to answer each of the following.

- *8. Does a plane have an edge?
9. Can a turtle crawl from the inside to the outside of a simple closed path without crossing the path?
10. Is a line segment a straight path with two endpoints?

Think Twice

11. Can you find 2 simple closed paths?
12. Can you find 3 simple closed paths? Draw them.

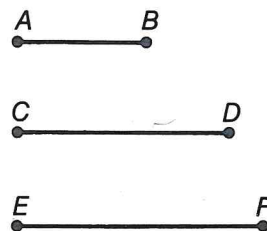


* 1. a, b, c, d 6. the rubber band. 8. No.

CONGRUENT SEGMENTS AND REGIONS

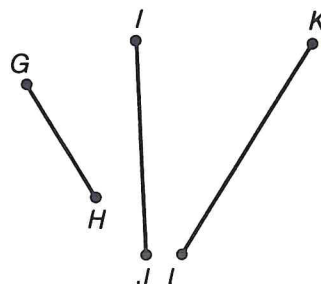
A. Endpoints are used to name line segments. The first path is *line segment AB*. The symbol \overline{AB} is read “line segment AB.”

- Name the other paths.
- Write the symbol for each path.



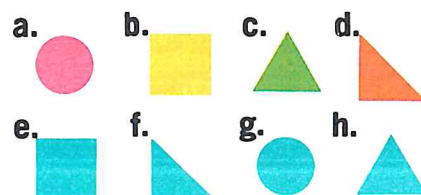
B. Trace \overline{AB} . Try to match it end to end with \overline{GH} . Do they match exactly? If they do, then the two paths are **congruent**.

- Which line segment is congruent to \overline{IJ} ? to \overline{KL} ?



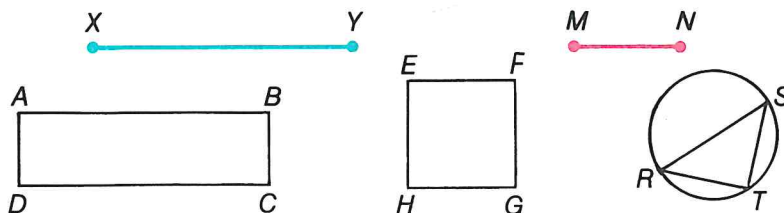
C. If two regions match exactly, then the regions are congruent.

- Which blue region is congruent to a? to b? to c? to d?



EXERCISES

Trace line segments \overline{XY} and \overline{MN} .



- *1. Which line segments in each figure are congruent to \overline{XY} ?
2. Which line segments in each figure are congruent to \overline{MN} ?

* 1. \overline{AB} ; \overline{DC}

Which figure is congruent to the blue figure?

*3.



a.



b.



c.



d.



4.



a.



b.



c.



d.



5.



a.



b.



c.



d.



One line segment can be used to mark off another line segment.

*6. How many line segments congruent to \overline{AB} are marked off on \overline{CD} ?



7. How many line segments congruent to \overline{EF} are marked off on \overline{GH} ?



One region can be used to mark off another region.

*8. How many regions congruent to **a** are marked off on region **b**?



9. How many regions congruent to **c** are marked off on region **d**?



Keeping Up with the Facts

1.
$$\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 9 \\ +4 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 8 \\ +2 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 15 \\ -6 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 11 \\ -7 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 13 \\ -8 \\ \hline \end{array}$$

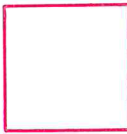
* 3. c 6. 6 8. 12

SIMPLE CLOSED PATHS

a.



b.



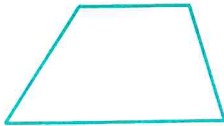
c.



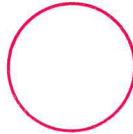
d.



e.



f.



g.



h.



A. Each simple closed path in the top row is a **rectangle**.

Which rectangle is also a **square**?

None of the paths in the next row is a rectangle.

- Which simple closed path above is a **triangle**?
- Which simple closed path is a **circle**?

B. Each simple closed path at the right is an **ellipse**.

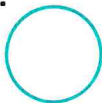
- Is any part of a circle or an ellipse straight?



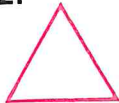
EXERCISES

Write a name for each simple closed path below.

*1.



2.



3.



4.



5.



* 1. Circle.

How could you arrange the pieces to make the figure named?

6. CIRCLE



7. ELLIPSE



8. SQUARE

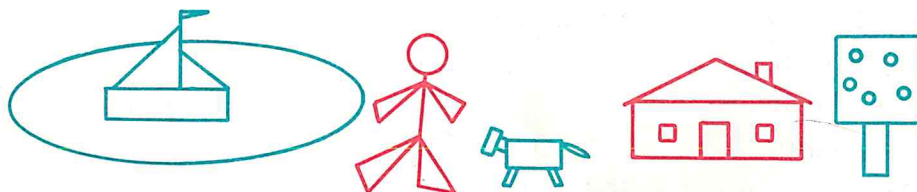


9. RECTANGLE



Name the simple closed paths you can find.

10.



Think Twice

How many rectangles can you find in each picture?

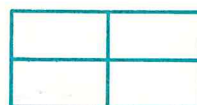
11.



12.



13.



How many triangles can you find in each picture?

14.



15.



16.



Keeping Up with the Facts

$$\begin{array}{r} 1. \ 14 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \ 11 \\ -9 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \ 12 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \ 13 \\ -6 \\ \hline \end{array}$$

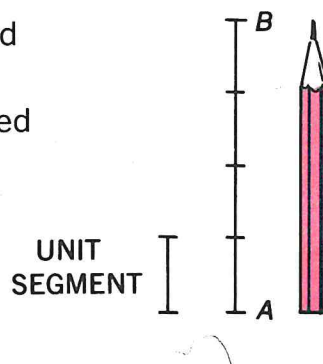
$$\begin{array}{r} 5. \ 10 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \ 16 \\ -7 \\ \hline \end{array}$$

MEASURING LINE SEGMENTS

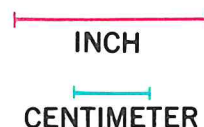
- A.** Congruent line segments are marked off on \overline{AB} using the *unit segment*. The number of unit segments marked off on \overline{AB} is the **measure** of \overline{AB} .

- What is the measure of \overline{AB} ?
- How can you use \overline{AB} to find the measure of the pencil?
The pencil is ? units long.



- B.** Using *standard units* makes it easier to tell other people about measure. Two standard units are segments called the **inch** and the **centimeter**.

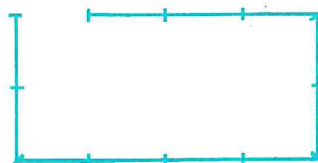
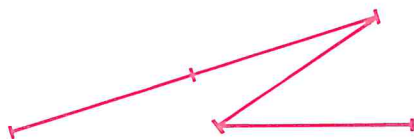
- Which is longer, an inch or a centimeter?



- C.** Longer units can be made using the inch and centimeter.



12 inches (in.) make 1 foot (ft.)
3 feet make 1 yard (yd.)
100 centimeters (cm) make 1 meter (m)

- ✓ Each path is marked in inches or centimeters. Trace each path with your finger. Tell the measure of each path.





EXERCISES

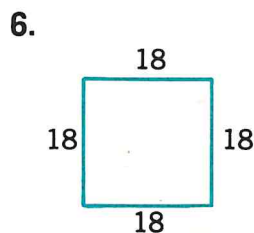
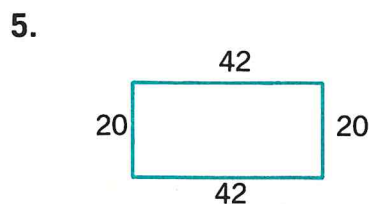
How many inches long is each segment?

- *1. 
2. 

How many centimeters long is each segment?

3. 
4. 

How many units would you move if you traveled around each rectangle just once? The measures of the segments are shown for each rectangle.



How many centimeters are as long as

- *7. 2 meters? 8. 8 meters? 9. 10 meters?

How many inches are as long as

10. 2 feet? 11. 3 feet? 12. 1 yard?

Think Twice

13. How far is it around a rectangle when one segment is 26 inches and another segment is 146 inches?
14. Which is longer a meter or a yard?

* 1. 4 inches. 7. 200 centimeters.

MEASURING PLANE REGIONS

A. Polly has covered the surface of her rectangular table with square sheets of paper.

- Think of each sheet of paper as a unit region.
- How many square unit regions cover the rectangular region?



B. *To measure a plane region you use a plane region as a unit. Then you find the number of congruent unit regions that are needed to cover the plane region.*

✓ The measure of the table top is ? square units.

EXERCISES

What is the measure of each region?

*1.



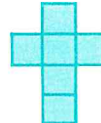
UNIT REGION



2.



3.



4.



UNIT REGION

5.



6.



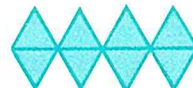
7.



8.



9.



UNIT REGION

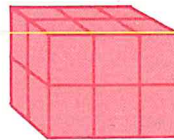
* 1 8

Answer the following questions.

- *10. Think of a stamp as a unit of measure. What is the measure of each page of stamps? What is the measure of both pages?



11. How many square units were needed to cover all three sides of this figure?

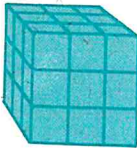


12. Suppose 25 square units cover the floor of your room. How many would be needed to cover both the floor and the ceiling?

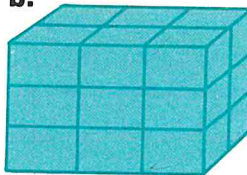


Think Twice

a.



b.



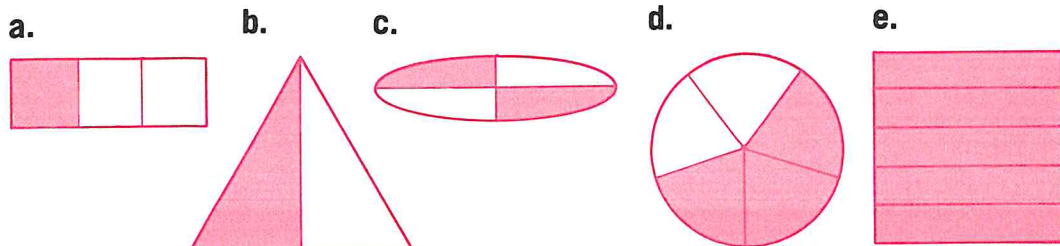
13. How many square units are needed to cover all six sides of box a?
14. How many square units are needed to cover all six sides of box b?

Keeping Up with the Facts

1. 6	2. 7	3. 4	4. 8	5. 7	6. 9
<u>+2</u>	<u>+7</u>	<u>+8</u>	<u>-7</u>	<u>-0</u>	<u>-5</u>

* 10. 10, 20

NUMBER PAIRS



A. Think of region **a** as a unit region.

It has been separated into congruent pieces.

- How many congruent pieces are red?
How many pieces are there in all?
- What does each number in the **number pair** (1, 3) tell you about region **a**?

B. Each of the other regions shown above has been separated into congruent pieces.

- Which region goes with the number pair (2, 4)?
What does each number in this number pair tell you?
- Which region goes with (3, 5)? with (5, 5)? with (1, 2)?
What does each number in each pair tell you?

C. For region **a** you can think, “One *out of* 3 pieces is red.”
You can also think, “One *of the* 3 pieces is red.”

- How can you think of each of the other regions?

D. Think of \overline{AB} as a unit segment.

- What does the number pair (3, 4) tell you?



E. What does the number pair (3, 7) tell you about this set of candies?



EXERCISES

Write a number pair that goes with each region.

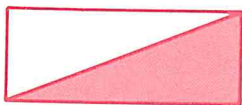
*1.



2.



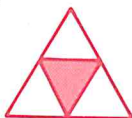
3.



4.



5.



6.



7.



8.



Write a number pair that goes with each segment.

*9.



10.



11.



12.



13.



14.



15.



16.



Write a number pair that goes with each set.

*17.



18.



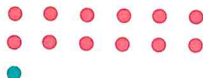
19.



20.



21.



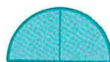
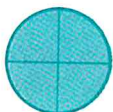
22.



Think Twice



UNIT REGION



A

23. What does the number pair (6, 4) show about figure A above?

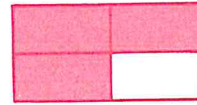
24. Draw a picture for the number pair (7, 4).

25. Draw a picture for the number pair (10, 4).

* 1. (1, 4) 9. (3, 5) 17. (4, 6)

FRACTIONAL NUMBERS

- A.** The number pair for this region is shown in two ways.



(3, 4) $\frac{3}{4}$

- How are they alike?
- How are they different?

- B.** When you think of “how much” of the region in **A** is red, you think of a **fractional number**. You think of “three-fourths.”

- The symbol $\frac{3}{4}$ is a **fraction**. It names a number pair. It also names a fractional number.
- Read each fraction in two ways.



$\frac{1}{2}$

1 out of 2
one-half



$\frac{2}{3}$

 ? out of 3
 ? - thirds



$\frac{3}{5}$

3 out of
 ? - fifths



$\frac{5}{6}$

 ? out of
 ? - sixths

- C.** Read each fraction.



$\frac{1}{6}$



$\frac{2}{6}$



$\frac{3}{6}$



$\frac{4}{6}$



$\frac{5}{6}$



$\frac{6}{6}$

- What do you notice about the first number in each pair?
- What do you notice about the second number in each pair?
- What do you notice about the green piece in each region?

- D.** Read the fractions.



$\frac{1}{2}$



$\frac{1}{3}$



$\frac{1}{4}$



$\frac{1}{5}$



$\frac{1}{6}$

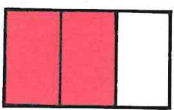
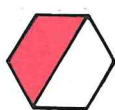
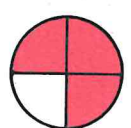
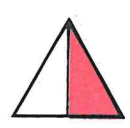






$\frac{1}{7}$





- What do you notice about the first number in each pair?
- What do you notice about the second number in each pair?


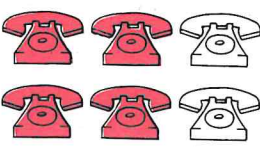


EXERCISES

Write a fraction to show how much of each is red.
Write another fraction to show how much is not red.

*1.  2.  3.  4. 

*5.  6.  7.  8. 

9.  10.  11.  12. 

*13.  14.  15.  16. 

Write a fraction to show how much of each region or segment is blue.
Do both fractions show the same amount?

*17a.  18a. 






b.  b. 




Replace \bullet with $<$ or $>$.

*19. $\frac{1}{2} \bullet \frac{1}{3}$ 20. $\frac{1}{5} \bullet \frac{1}{6}$ 21. $\frac{1}{7} \bullet \frac{1}{4}$ 22. $\frac{1}{6} \bullet \frac{1}{2}$
23. $\frac{1}{6} \bullet \frac{2}{6}$ 24. $\frac{3}{6} \bullet \frac{6}{6}$ 25. $\frac{5}{6} \bullet \frac{4}{6}$ 26. $\frac{6}{6} \bullet \frac{1}{6}$

Think Twice

Write a fraction for the picture in each exercise.

27.   28.   

29.  30.  

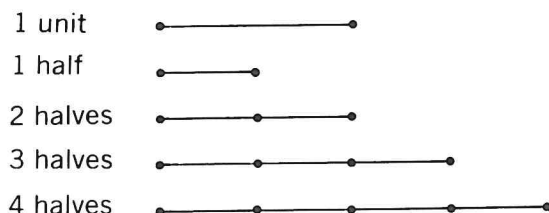
UNIT UNIT

*1. $\frac{2}{3}; \frac{1}{3}$ 5. $\frac{1}{2}; \frac{1}{2}$ 13. $\frac{1}{4}; \frac{3}{4}$ 17. $\frac{1}{2}; \frac{2}{4}$; yes. 19. $>$

HALVES AND FOURTHS

A. The measure of the unit segment is 1.

- What is the measure of the other segments?

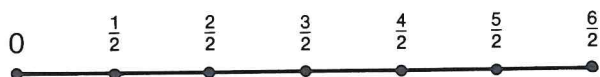


B. Begin at 0 on each segment. Count the steps.

- Count by ones.



- Count by halves.

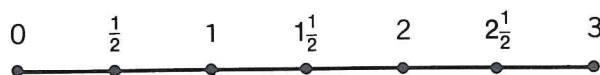


- Count by ones and halves this way:

One-half, one, one and one-half, two, two and one-half, three.

- Compare.

$\frac{2}{2}$ and 1 $\frac{3}{2}$ and $1\frac{1}{2}$ $\frac{4}{2}$ and 2 $\frac{0}{2}$ and 0



C. Begin at 0 on each segment. Count the steps.

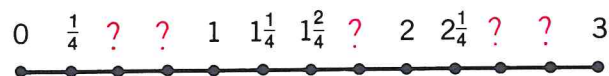
- Count by ones.



- Count by fourths.



- Count by ones and fourths.

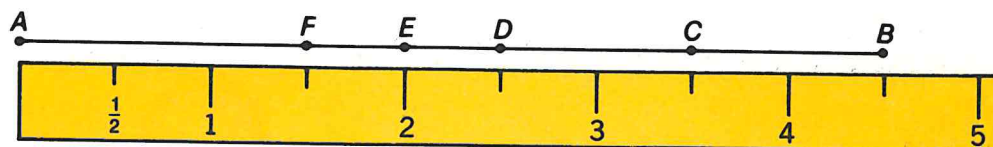


- Compare.

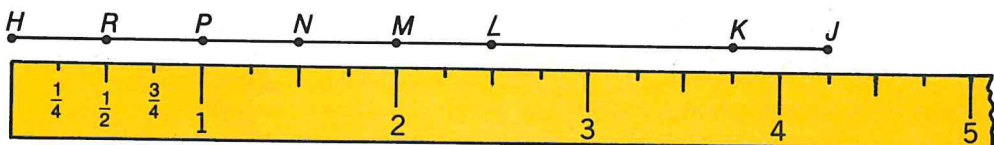
$\frac{4}{4}$ and 1 $\frac{8}{4}$ and 2 $\frac{12}{4}$ and 3 $\frac{0}{4}$ and 0

EXERCISES

What is the measure of each segment named in Ex. 1–16?

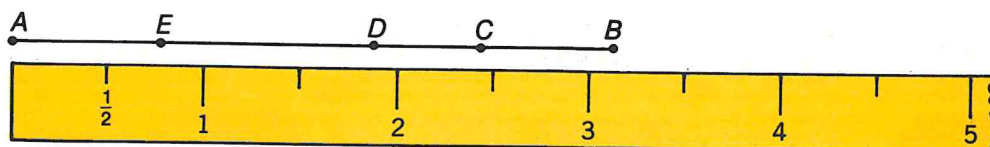


- | | | | |
|---------------------|--------------------|--------------------|--------------------|
| *1. \overline{AB} | 2. \overline{AC} | 3. \overline{AD} | 4. \overline{AE} |
| 5. \overline{AF} | 6. \overline{DA} | 7. \overline{BA} | 8. \overline{CA} |



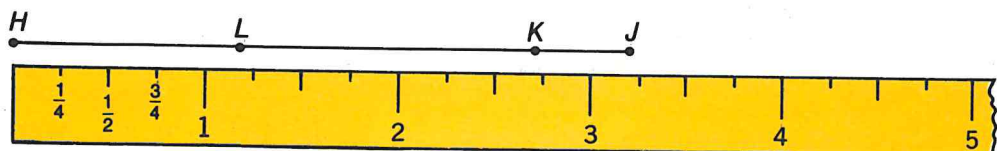
- | | | | |
|---------------------|---------------------|---------------------|---------------------|
| *9. \overline{HJ} | 10. \overline{HK} | 11. \overline{HL} | 12. \overline{HM} |
| 13. \overline{HN} | 14. \overline{HP} | 15. \overline{HR} | 16. \overline{JH} |

Is B nearer to 3 inches or $3\frac{1}{2}$ inches? Then to the nearest half-inch the measure of \overline{AB} is 3 inches. Find the measure of each segment to the nearest half-inch.



- | | | | | |
|----------------------|---------------------|---------------------|---------------------|---------------------|
| *17. \overline{AC} | 18. \overline{AD} | 19. \overline{AE} | 20. \overline{BA} | 21. \overline{DA} |
|----------------------|---------------------|---------------------|---------------------|---------------------|

Is J nearer to 3 inches or $3\frac{1}{4}$ inches? Then to the nearest quarter-inch the measure of \overline{HJ} is $3\frac{1}{4}$ inches. Find the measure of each segment to the nearest quarter-inch.



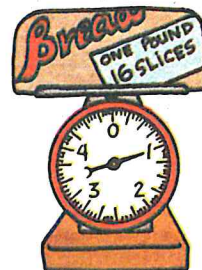
- | | | | | |
|----------------------|---------------------|---------------------|---------------------|---------------------|
| *22. \overline{HK} | 23. \overline{HL} | 24. \overline{JH} | 25. \overline{LH} | 26. \overline{KH} |
|----------------------|---------------------|---------------------|---------------------|---------------------|

* 1. $4\frac{1}{2}$ 9. $4\frac{1}{4}$ 17. $2\frac{1}{2}$ inches. 22. $2\frac{3}{4}$ inches.

POUNDS AND OUNCES

A. The loaf of bread weighs one pound.

- How much will 2 loaves weigh?
3 loaves? 4 loaves?
- How many slices are in the loaf of bread?



B. There is 1 slice of bread on the scale. It weighs 1 ounce.

- How much will 4 slices weigh?
6 slices? 8? 12? 16?

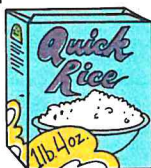


16 ounces (oz.) make 1 pound (lb.)

EXERCISES

What is the weight of each of these groceries in ounces?

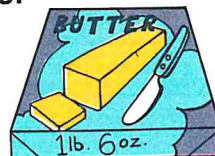
1.



2.

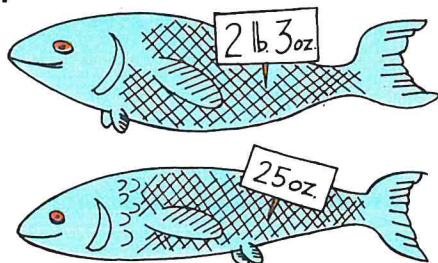


3.



Which weighs more?

4.



5.



MEASURING TEMPERATURE

A. A thermometer shows the **temperature** of the air.

It shows how warm the air is.

- The thermometer at the right shows a temperature of 40 degrees.

- 40 degrees is written 40° .

Find these temperatures on the thermometer.

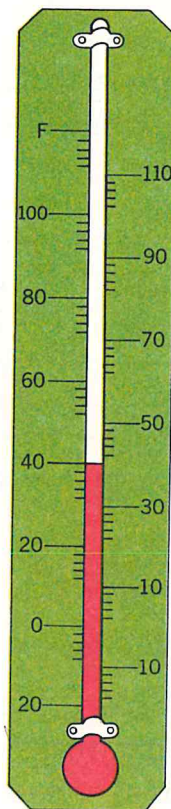
30° , 32° , 50° , 54° , 70° , 76°

B. When the air gets warmer, the red liquid goes up.

- Where would the top of the red liquid be when the temperature is 10° warmer than 40° ?

C. When the air gets cooler, the red liquid goes down.

- Where would the top of the red liquid be when the temperature is 10° cooler than 40° ?



EXERCISES

Write the correct temperature.

- | | |
|--|--|
| 1. 10° cooler than 70° . | 2. 20° cooler than 30° . |
| 3. 10° warmer than 80° . | 4. 40° warmer than 20° . |

Find the answer.

5. How many degrees cooler is 20° than 50° ?
6. How many degrees warmer is 70° than 40° ?
7. The thermometer showed 55° at noon. It was 13° cooler at night. What did the thermometer show then?

MEASURING LIQUIDS

- A.** Doris uses a quart of water to make lemonade.
Suppose she uses a pint bottle to measure the water.
How many times must she fill the pint bottle?

1 cup (c.) makes 1 half-pint.
2 cups make 1 pint (pt.)
2 pints make 1 quart (qt.)
4 quarts make 1 gallon (gal.)

- Since 2 pints make 1 quart, she fills the pint bottle ? times.

EXERCISES

Use the chart to help you complete each sentence.

- 2 pints make ? quart.
- 2 quarts make ? half-gallon.
- 1 pint makes ? cups.
- 1 gallon makes ? quarts.
- $\frac{1}{2}$ pint makes ? cup.
- 1 gallon makes ? pints.

Find the answer.

- Alice had a quart of milk.
She used 2 pints. How
much milk was left?
- A half-pint of juice will
serve 1 person. Will a
quart serve 4 persons?

1 pt.	1 pt.	1 pt.	1 pt.	1 pt.	1 pt.	1 pt.	1 pt.
1 qt.	1 qt.	1 qt.	1 qt.				
1 gallon							

Think Twice

- How many quarts of milk will fill 12 half-pint cartons?
- How many cups will a gallon of milk fill?
- How many quarts of water will fill a $2\frac{1}{2}$ gallon fishtank?

NUMBER SENTENCES

- A.** There are 9 children playing on the jungle gym. If 6 of them are boys, how many are girls?



- What added to 6 is 9?

$$6 + n = 9$$

- Can you also use $9 - 6 = n$ to find the answer?

- B.** Billy has 3 long-sleeved shirts and 4 short-sleeved shirts. How many shirts is that?

- Can you use $3 + 4 = n$ to find the answer?
- Write another number sentence you could use.

EXERCISES

A number sentence is given for each problem. Write another sentence to use to solve the problem. Then solve the problem.

- Joyce is 8 years old today. She has 2 candles for her birthday cake. How many more does she need?
 $2 + n = 8$
- Ken has 8 pet gerbils. If 3 are male, how many are female?
 $3 + n = 8$
- Anne has a nickel and 9 pennies. How much money is that?
 $5 + 9 = n$
- In a game, Gay tossed two bags of beans. Her scores were 7 and 6. What was her total score?
 $7 + 6 = n$
- Ella babysat from 2 o'clock until 6 o'clock. How many hours is that?
 $2 + n = 6$
- Of 13 boats, 4 are canoes. The others are rowboats. How many are rowboats?
 $13 - 4 = n$

KEEPING UP IN MATHEMATICS

Find the answers. [68-72]

$$\begin{array}{r} 1. \quad 56 \\ + 25 \\ \hline \end{array} \quad \begin{array}{r} 2. \quad 69 \\ + 33 \\ \hline \end{array} \quad \begin{array}{r} 3. \quad 48 \\ + 18 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 49 \\ + 26 \\ \hline \end{array} \quad \begin{array}{r} 5. \quad 62 \\ + 19 \\ \hline \end{array} \quad \begin{array}{r} 6. \quad 49 \\ + 34 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 25 \\ + 93 \\ \hline \end{array} \quad \begin{array}{r} 8. \quad 32 \\ + 81 \\ \hline \end{array} \quad \begin{array}{r} 9. \quad 45 \\ + 72 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 284 \\ + 245 \\ \hline \end{array} \quad \begin{array}{r} 11. \quad 420 \\ + 386 \\ \hline \end{array} \quad \begin{array}{r} 12. \quad 456 \\ + 253 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 93 \\ + 57 \\ \hline \end{array} \quad \begin{array}{r} 14. \quad 76 \\ + 44 \\ \hline \end{array} \quad \begin{array}{r} 15. \quad 68 \\ + 32 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 289 \\ + 62 \\ \hline \end{array} \quad \begin{array}{r} 17. \quad 357 \\ + 264 \\ \hline \end{array} \quad \begin{array}{r} 18. \quad 293 \\ + 309 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 542 \\ + 158 \\ \hline \end{array} \quad \begin{array}{r} 20. \quad 137 \\ + 684 \\ \hline \end{array} \quad \begin{array}{r} 21. \quad 475 \\ + 235 \\ \hline \end{array}$$

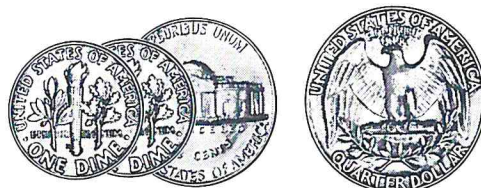
Show three subsets of each set.

[1]

$$22. \{ \bigcirc \quad \triangle \quad \square \}$$

$$23. \{ \text{rectangle} \quad \text{oval} \quad \text{I} \}$$

Answer each question. [17]



24. You buy a 10¢ candy in a machine. You put in 25¢. How much change do you get?

25. Put a dime in the telephone. Then dial the number. The operator says, "Ten cents more, please." How much is the call?

Answer each question. [18-19]



26. You start at 4:30. You practice for 45 minutes. What time do you stop?

27. Cookies bake in 30 minutes. Start the cookies at 2:30. At what time are they baked?

28. The meeting starts at 6:00. You are 15 minutes early. What time is it?

MONEY

A. A *quarter* is one fourth of a dollar.
It is worth 25 cents.

- How many quarters are worth as much as 1 dollar?



B. A *half dollar* is one half of a dollar.
It is worth 50 cents.

- How many half dollars are worth as much as 1 dollar?
- How many quarters are worth as much as 1 half dollar?



C. You can show a *dollar* with

- a dollar sign and cents point. \$1.00
- a cents sign. 100¢

✓ Show each of these amounts two ways.

- One dollar and fifty cents.
- Two dollars and a quarter.



EXERCISES

How many pennies are worth as much as

- | | |
|-----------------|---------------------------------|
| *1. 3 quarters? | 2. a half dollar and a quarter? |
| 3. a dollar? | 4. a dollar and 2 quarters? |

You have a quarter. How much will you have left if you spend

- | | | | | |
|---------|---------|---------|---------|--------|
| *5. 5¢? | 6. 15¢? | 7. 20¢? | 8. 10¢? | 9. 8¢? |
|---------|---------|---------|---------|--------|

You have a half dollar. How much will you have left if you spend

- | | | | | |
|-----------|----------|----------|----------|----------|
| *10. 25¢? | 11. 40¢? | 12. 45¢? | 13. 15¢? | 14. 20¢? |
|-----------|----------|----------|----------|----------|

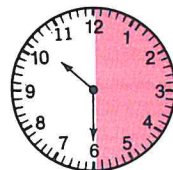
* 1. 75 5. 20¢ 10. 25¢

TELLING TIME

A. What part of the clock is red?

It is **half past** the hour.

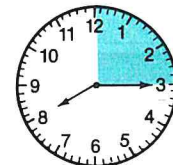
■ How many minutes make a half hour?



B. What part of the clock is blue?

It is a **quarter past** the hour.

■ How many minutes make a quarter hour?



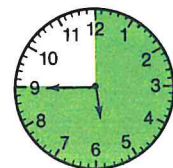
C. What part of the clock is green?

■ How many minutes make 3 quarters of an hour?

■ What part is white?

It is a **quarter of** the hour.

■ How many minutes before the hour is a quarter of the hour?



EXERCISES

Between what two numerals is the hour hand pointing at

* 1. a quarter past four?

2. a quarter of ten?

3. half past eleven?

4. fifteen before two?

5. nine forty-five?

6. thirty minutes before one?

At what numeral does the minute hand point at

* 7. a quarter of any hour?

8. a quarter past any hour?

9. any half hour?

10. any hour?

Tell the time for each clock. Then write the time.

* 11.



12.



13.



14.



* 1. 4 and 5 7. 9 11. Fifteen minutes past six. 6:15

ROMAN NUMERALS

A. The red figures on the clock are called **Roman numerals**.

- What time does the clock show?
- What hour is it when the short hand points to I? II? III? IV? V? VI? VII? VIII? IX? X? XI? XII?



B. Since $V = 5$ and $I = 1$, then $VI = 1$ more than 5 or ?.

- What number is named by VII? by VIII?
- What number is named by X? by XI? by XII?

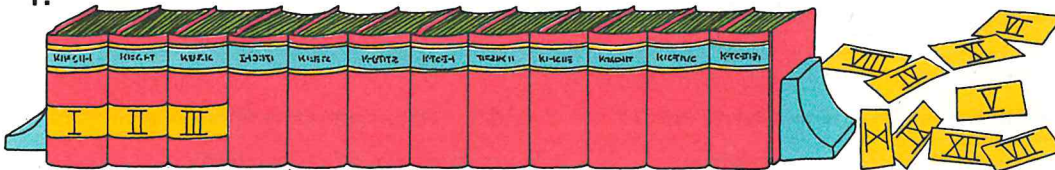
C. Since $I = 1$ and $V = 5$, then $IV = 1$ less than 5 or ?.

- How are IV and VI alike? How are they different?
- What number is named by IX? by XI?

EXERCISES

How would you complete the labeling of this set of books?

1.



Write the Roman numeral that shows

- | | |
|--------------------|--------------------|
| *2. 1 more than 1. | 3. 2 more than 1. |
| 4. 2 more than 5. | 5. 3 more than 5. |
| 6. 1 more than 10. | 7. 2 more than 10. |

Write the Roman numeral that shows

- | | |
|-------------------|--------------------|
| 8. 1 less than 5. | 9. 1 less than 10. |
|-------------------|--------------------|

* 2. II

CHECKPOINT

- ✓ Check your understanding of **key terms and phrases**.
Use each in a sentence.

closed surface	fraction	line segment
number pair	simple closed path	congruent
fractional number	ellipse	plane region
point	Roman numerals	temperature

- ✓ Check your understanding of **key ideas**.

1a. Draw a simple closed path.
Show a point outside the path
and a line segment inside it.

1b. When is a point inside a
simple closed path? on it?
outside it?

2a. Is the red region congruent
to the blue region?



2b. How can you tell if
two regions are congruent?

3a. Write a number pair for
the pieces that are shaded.



3b. What does a number
pair tell about a region?

4a. What is the measure of A?



4b. How do you find the
measure of a region?

- ✓ Check your **skills**.

1. What is the measure of \overline{AB} in inches?



2. What is the measure of \overline{CD} in centimeters?



UNIT TEST

Find the answers.

1. What is the measure of \overline{AB} ?



2. Which figure is congruent to the figure in red?

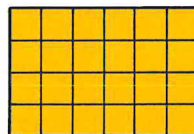


3. Which is worth more?

a. A half dollar.

b. A quarter and 4 pennies.

4. Think of each square as a unit region. What is the measure of the region in square units?



5. Peter made a rectangle out of straws. How many straws did he use?

6. What fractional number tells the part of the figure that is red?



7. There are 8 pints in a gallon. How many pints in two gallons?

8. The temperature was 50° at 9 o'clock. It was 65° at noon.

How much warmer was it at noon?

9. What time is shown on the clock?

10. The ball game started at 8:00 P.M. It ended at 11:00 P.M. How many hours did the game last?



If you have time, try these.

11. How much greater is the number VI than the number IV?
12. How much less is the number VII than the number XII?

INQUIRY INTO GEOMETRY

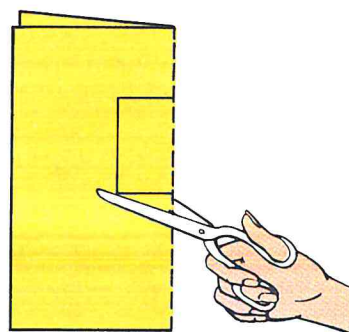
Paper Folding

You can cut out many geometric shapes from a folded sheet of paper. Try to guess what shape each cutout will be when you unfold it.

- When you cut, be sure to start and end on the fold.

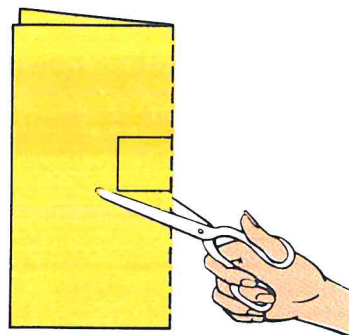
A RECTANGULAR REGION

- Fold a sheet of paper.
Cut out a **rectangular region**.
Now unfold.
What shape is the cutout?
Was your guess correct?
- Cut out a smaller rectangular region.
Cut out a larger rectangular region.
What shape do you always get
when you unfold?
Compare the size of the folded
cutout and unfolded cutout.



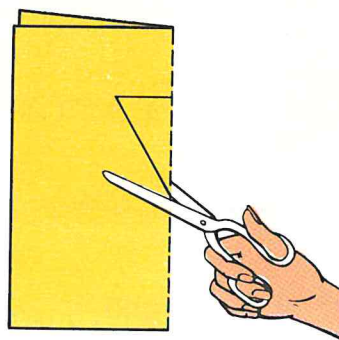
A SQUARE REGION

- Fold a sheet of paper.
Cut out a **square region**.
Unfold the cutout.
What shape is it?
- Cut out a rectangular region
from a folded sheet of paper
so that the unfolded cutout will be a square region.

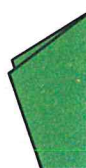


A TRIANGULAR REGION

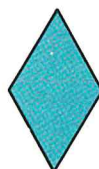
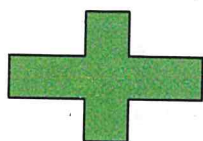
- Cut out a **triangular region** as shown in the drawing. What shape is the unfolded region?
- Find a way to cut out a triangular region to get a region that when unfolded is not a triangular region.



Guess what shape each cutout below will be when you unfold it. Check to see if your guess is correct.

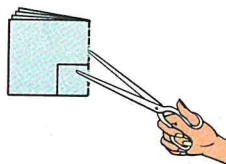


Cut out regions from a folded sheet of paper that will look like the regions below when unfolded.



For Further Inquiry

- Fold a sheet of paper twice. Cut out a square region as shown in the drawing. Guess what shape the cutout will be when you unfold it.



- Fold a sheet of paper twice and cut out a region that will be square when unfolded. Use just one cut.

PATTERNS IN SUBTRACTION

A. Look for a pattern.

Sum	s	8	10	12	14	16	18	20
Known Addend	k	-2	-2	-2	-2	-2	-2	-2
Unknown Addend	$s - k$	$\frac{6}{}$	$\frac{8}{}$	$\frac{10}{}$	$\frac{12}{}$	$\frac{14}{}$	$\frac{16}{}$	$\frac{18}{}$

- As you move to the right, does s remain the same?
Does it decrease? Does it increase?
As you move to the right, what do you notice about k ?
As you move to the right, what do you notice about $s - k$?
- Make a rule. When the sum increases and the known addend does not change, what happens to the unknown addend?

B. Look for a pattern.

s	38	38	38	38	38	38	38	38
k	-0	-2	-4	-6	-8	-10	-12	-14
$s - k$	$\frac{38}{}$	$\frac{36}{}$	$\frac{34}{}$	$\frac{32}{}$	$\frac{30}{}$	$\frac{28}{}$	$\frac{26}{}$	$\frac{24}{}$

- What do you notice about s ? about k ? about $s - k$?
- Make a rule. When the known addend increases and the sum does not change, what happens to the unknown addend?

C. Look for a pattern.

s	10	12	14	16	18	20	22	24
k	-3	-5	-7	-9	-11	-13	-15	-17
$s - k$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$

- As s increases, what happens to k ?
How do the increases compare?
What do you notice about $s - k$?
- Make a rule. When the sum and known addend both increase by the same number, what happens to the unknown addend?

EXERCISES

Copy and complete. What patterns do you notice?

1.	s	9	11	13	15	17	19
	k	-2	-2	-2	-2	-2	-2
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

2.	s	10	20	30	40	50	60
	k	-6	-16	-26	-36	-46	-56
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

3.	s	38	38	38	38	38	38
	k	-5	-10	-15	-20	-25	-30
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

Replace \bullet with $<$, $=$, or $>$. Use the patterns you have discovered.

- *4. Since $14 - 9 = 5$, then $15 - 10 \bullet 5$.
- 5. Since $10 - 2 = 8$, then $10 - 6 \bullet 8$.
- 6. Since $53 - 27 = 26$, then $53 - 37 \bullet 26$.
- 7. Since $36 - 20 = 16$, then $46 - 20 \bullet 16$.
- 8. Since $46 - 19 = 27$, then $56 - 29 \bullet 27$.
- *9. Since $896 - 674 = 222$, then $900 - 674 \bullet 222$.
- 10. Since $496 - 50 = 446$, then $496 - 100 \bullet 446$.
- 11. Since $867 - 260 = 607$, then $967 - 360 \bullet 607$.

Think Twice

Solve each sentence using the patterns you have discovered.

- 12. $47 - 22 = 25$, so $50 - \square = 28$.
- 13. $23 - 14 = 9$, so $\square - 18 = 5$.
- 14. $30 - 25 = 5$, so $35 - \square = 5$.
- 15. $196 - 150 = 46$, so $\square - 160 = 36$.

* 4. = 9. >

ESTIMATING IN SUBTRACTION

A. Look at the hundreds in the example at the right.

■ $7 - 2 = 5$, so $700 - 200 = 500$

- Compare 82 with 82.

Is 82 less than, equal to,
or greater than 82?

- Why is n equal to exactly 500?

$$782 - 282 = n$$

$$700 - 200 = 500$$

$$82 = 82$$

$$\text{So } n = 500$$

B. Look at the hundreds in the example at the right.

■ $700 - 200 = \underline{\quad}$

- Compare 82 with 35.

Is 82 less than, equal to,
or greater than 35?

- Why is n greater than 500?

Then n is equal to 500-some.

$$782 - 235 = n$$

$$700 - 200 = 500$$

$$82 > 35$$

$$\text{So } 782 - 235 > 500$$

$$782 - 235 \text{ is 500-some}$$

C. Look at the hundreds in the example at the right.

- How are they like the
hundreds in **A**? **B**?

- Compare 82 with 97.

Is 82 less than, equal to,
or greater than 97?

- Why is n less than 500?

Why is n equal to 400-some?

$$782 - 297 = n$$

$$700 - 200 = 500$$

$$82 < 97$$

$$\text{So } 782 - 297 < 500$$

$$782 - 297 \text{ is 400-some}$$

EXERCISES

Write the correct hundred.

*1. $726 - 426 = 300$

$$730 - 426 \text{ is 300-some}$$

$$720 - 426 \text{ is } \underline{\quad}\text{-some}$$

2. $953 - 553 = 400$

$$953 - 552 \text{ is } \underline{\quad}\text{-some}$$

$$953 - 554 \text{ is } \underline{\quad}\text{-some}$$

* 1. 200-some

Replace ● with $<$, $=$, or $>$.

- *3. $700 - 300$ ● 400 4. $900 - 200$ ● 500 5. $735 - 535$ ● 200
 $735 - 300$ ● 400 $967 - 200$ ● 500 $752 - 535$ ● 200
 $700 - 335$ ● 400 $900 - 267$ ● 500 $735 - 552$ ● 200

Write the hundreds for n .

Example: $653 - 350 = n$ Answer: $n = 300$ -some

- *6. $275 - 173 = n$ 7. $263 - 65 = n$ 8. $225 - 27 = n$
 9. $237 - 35 = n$ 10. $237 - 39 = n$ 11. $263 - 63 = n$
 12. $257 - 54 = n$ 13. $357 - 160 = n$ 14. $193 - 90 = n$
 15. $493 - 95 = n$ 16. $373 - 171 = n$ 17. $473 - 175 = n$
 18. $260 - 62 = n$ 19. $560 - 57 = n$ 20. $490 - 250 = n$
 21. $490 - 295 = n$ 22. $873 - 71 = n$ 23. $873 - 75 = n$
 24. $962 - 75 = n$ 25. $962 - 475 = n$ 26. $962 - 775 = n$

Think Twice

Which is greater?

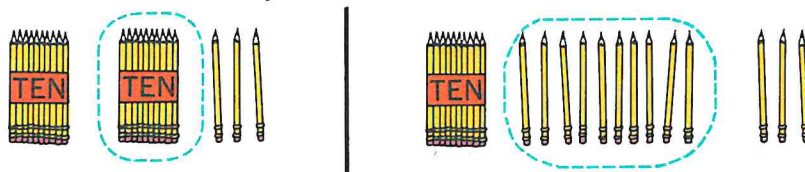
27. $975 - 163$ or $975 - 167$ 28. $737 - 142$ or $757 - 135$
 29. $\textcircled{9}\textcircled{9}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0} - \textcircled{9}\textcircled{0}\textcircled{0}\textcircled{0}$ or $\textcircled{9}\textcircled{9}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0} - \textcircled{9}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0}$

Keeping Up with the Facts

- | | | | | | |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 8 \\ +4 \\ \hline \end{array}$ | 2. $\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$ | 5. $\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$ | 6. $\begin{array}{r} 5 \\ +0 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ | 8. $\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$ | 9. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ | 10. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ | 11. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 12. $\begin{array}{r} 13 \\ -5 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 11 \\ -5 \\ \hline \end{array}$ | 14. $\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$ | 15. $\begin{array}{r} 15 \\ -9 \\ \hline \end{array}$ | 16. $\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$ | 17. $\begin{array}{r} 13 \\ -8 \\ \hline \end{array}$ | 18. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$ |

* 3. $=$; $>$; $<$ 6. 100-some

RENAMING A TEN AS ONES



A. Both pictures show the same number of pencils, 23.

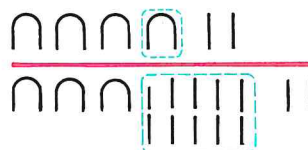
- The picture at the left shows 2 tens 3 ones.
- In the picture at the right, 1 bundle of 10 has been opened. The picture shows 1 ten ones.

B. Both pictures below show the same amount of money, 31¢.

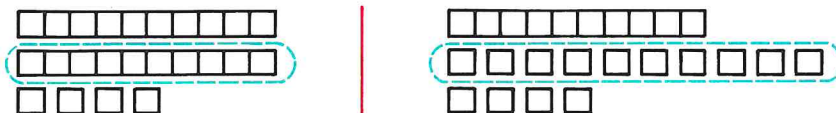


- The picture at the left shows dimes pennies.
- In the picture at the right, 1 dime has been changed for pennies. The picture shows dimes pennies.

C. A heelbone at the right has been renamed with strokes. Name the number shown in two ways.



D. One strip of ten blocks has been separated into single blocks. Name the number shown in two ways.



- ✓ In **A**, **B**, **C**, and **D** above, 1 ten was renamed as ones.
Each number was renamed as less ten and more ones.

EXERCISES

A ten has been renamed as 10 ones. Find n .

- | | |
|--------------------------------------|--------------------------|
| *1. 7 tens 2 ones = n tens 12 ones | 2. $37 = n$ tens 17 ones |
| 3. 6 tens 0 one = n tens 10 ones | 4. $79 = n$ tens 19 ones |
| 5. 3 tens 4 ones = n tens 14 ones | 6. $29 = n$ tens 19 ones |
| 7. $46 = n + 16$ | 8. $52 = n + 12$ |
| 9. $17 = n + 17$ | 10. $87 = n + 17$ |
| 11. $62 = n + 12$ | 12. $99 = n + 19$ |

A ten has been renamed as 10 ones. Find n .

- | | |
|--------------------------------------|----------------------------|
| *13. 5 tens 3 ones = 4 tens n ones | 14. $62 = 5$ tens n ones |
| 15. 7 tens 9 ones = 6 tens n ones | 16. $82 = 7$ tens n ones |
| 17. 4 tens 0 ones = 3 tens n ones | 18. $59 = 4$ tens n ones |
| 19. $33 = 20 + n$ | 20. $75 = 60 + n$ |
| 21. $68 = 50 + n$ | 22. $97 = 80 + n$ |
| 23. $70 = 60 + n$ | 24. $23 = 10 + n$ |

Each number has been renamed. Find n .

- | | |
|--|--------------------------|
| *25. 2 hundreds 5 tens 7 ones = 2 hundreds 4 tens n ones | |
| 26. 7 hundreds 2 tens 0 ones = 7 hundreds n tens 10 ones | |
| 27. $340 = 300 + 30 + n$ | 28. $270 = 200 + n + 10$ |
| 29. $968 = 900 + 50 + n$ | 30. $321 = 300 + n + 11$ |

Rename each number to show 1 less ten and 10 more ones.

- | | | |
|--------------------|-------------------|-------------------|
| *31. 7 tens 2 ones | 32. 3 tens 5 ones | 33. 8 tens 0 ones |
| *34. 86 | 35. 92 | 36. 80 |
| 37. 68 | 38. 70 | |
| 39. 123 | 40. 247 | 41. 761 |
| 42. 873 | 43. 267 | |

Keeping Up with the Facts

- | | | | | | |
|--|--|--|--|--|--|
| 1. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ | 2. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 13 \\ -6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ | 5. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 6. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ |
|--|--|--|--|--|--|

* 1. 6 13. 13 25. 17 31. 6 tens 12 ones 34. 7 tens 16 ones

SUBTRACTING NUMBERS NAMED BY TWO DIGITS

- A.** Neal has 46 clips. He uses 27.
Can you tell how many he has left?



- Compare the ones.
Is 7 greater than 6?
Then is $6 - 7$ a whole number?
- You must rename the sum, 46.

$$\begin{array}{r} 46 \\ -27 \\ \hline \end{array}$$

- B.** Here are two ways to show the renaming of the sum.

a.

$$\begin{array}{r} \textcolor{red}{3} \quad \textcolor{red}{16} \\ \cancel{4} \text{ tens } \cancel{6} \text{ ones} \\ -2 \text{ tens } 7 \text{ ones} \\ \hline 1 \text{ ten } 9 \text{ ones, or } 19 \end{array}$$

b.

$$\begin{array}{r} \textcolor{red}{3} \text{ } \textcolor{red}{16} \\ \cancel{4} \cancel{6} \\ -27 \\ \hline 19 \end{array}$$

- In each way, 1 ten was renamed as ? ones.
Add the 10 ones to the 6 ones to get ? ones.
- Now subtract the ones. $16 - 7 = \underline{\quad}$
Then subtract the tens. $3 \text{ tens} - 2 \text{ tens} = \underline{\quad}$ ten
- What is the answer?

- C.** You can check subtraction
by using addition.

Example *Check*

$$\begin{array}{r} \textcolor{teal}{46} \\ -\textcolor{teal}{27} \\ \hline \textcolor{teal}{19} \end{array} \qquad \begin{array}{r} \textcolor{teal}{19} \\ +\textcolor{teal}{27} \\ \hline \textcolor{teal}{??} \end{array}$$

- Is the sum in the check the
same as the sum in the example?

EXERCISES

Rename each as 1 less ten and 10 more ones.

- *1. $\textcolor{red}{?} \text{ } \textcolor{red}{14}$ 2. $\textcolor{red}{8} \text{ } \textcolor{red}{??}$ 3. $\textcolor{red}{6} \text{ } \textcolor{red}{??}$ 4. $\textcolor{red}{6} \text{ } \textcolor{red}{??}$ 5. $\textcolor{red}{?} \text{ } \textcolor{red}{??}$ 6. $\textcolor{red}{?} \text{ } \textcolor{red}{??}$

*1. 7

Copy and complete. Then give the simplest name for the answer.

$$\begin{array}{r} \overset{6}{7} \text{ tens } \overset{14}{4} \text{ ones} \\ - 3 \text{ tens } 8 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} \overset{8}{9} \text{ tens } \overset{??}{0} \text{ ones} \\ - 7 \text{ tens } 9 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} \overset{?}{6} \text{ tens } \overset{??}{2} \text{ ones} \\ - 2 \text{ tens } 5 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

Copy and complete.

$$\begin{array}{r} \overset{3}{4} \overset{16}{0} \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{6} \overset{??}{0} \\ - 32 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{2} \overset{??}{0} \\ - 139 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{?}{4} \overset{10}{0} \\ - 197 \\ \hline \end{array}$$

Copy. Find the answer by any way you wish.

$$\begin{array}{r} 70 \\ - 35 \\ \hline \end{array}$$

$$\begin{array}{r} 75 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 44 \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} 73 \\ - 25 \\ \hline \end{array}$$

$$\begin{array}{r} 68 \\ - 26 \\ \hline \end{array}$$

$$\begin{array}{r} 81 \\ - 49 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 72 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 65 \\ - 48 \\ \hline \end{array}$$

$$\begin{array}{r} 52 \\ - 28 \\ \hline \end{array}$$

$$\begin{array}{r} 45 \\ - 28 \\ \hline \end{array}$$

Write an estimate first. Then copy and find the unknown addend.

$$\begin{array}{r} 73 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 85 \\ - 27 \\ \hline \end{array}$$

$$\begin{array}{r} 45 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 53 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 95 \\ - 27 \\ \hline \end{array}$$

$$\begin{array}{r} 435 \\ - 127 \\ \hline \end{array}$$

$$\begin{array}{r} 774 \\ - 350 \\ \hline \end{array}$$

$$\begin{array}{r} 684 \\ - 349 \\ \hline \end{array}$$

$$\begin{array}{r} 391 \\ - 258 \\ \hline \end{array}$$

$$\begin{array}{r} 495 \\ - 169 \\ \hline \end{array}$$

Use the addition check to find if the answers are correct.

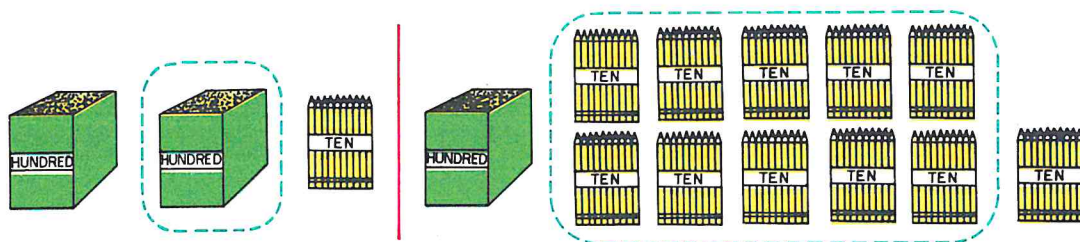
$$\begin{array}{r} 120 \\ - 59 \\ \hline 61 \end{array}$$

$$\begin{array}{r} 133 \\ - 48 \\ \hline 95 \end{array}$$

$$\begin{array}{r} 443 \\ - 27 \\ \hline 406 \end{array}$$

$$\begin{array}{r} 75 \\ - 36 \\ \hline 39 \end{array}$$

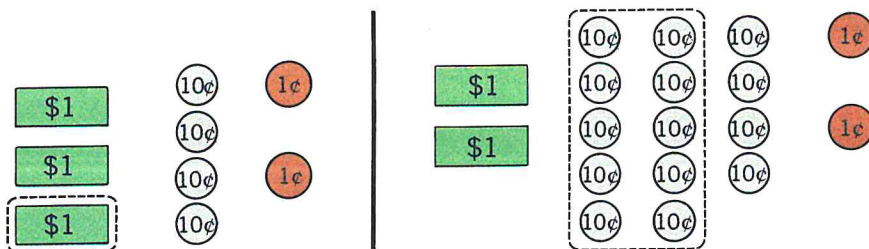
RENAMING A HUNDRED AS TENS



A. Both pictures above show the same number of pencils, 210.

- The picture at the left shows 2 hundreds 1 ten.
- In the picture at the right, 1 box of 100 has been opened.
The picture shows hundred tens.
- 2 hundreds 1 ten = 1 hundred tens.

B. How is the picture at the right below different from the one at the left? How are they alike?



- 3 dollars 4 dimes 2 pennies = 2 dollars dimes 2 pennies.
- $342 = 200 + \underline{\hspace{1cm}} + 2$

C. A coiled rope below has been renamed as 10 heelbones.



- $222 = 100 + \underline{\hspace{1cm}} + 2$

✓ In **A**, **B**, and **C** above, 1 hundred was renamed as tens.
Each number was renamed as less hundred and more tens.

EXERCISES

- *1. $568 = 5$ hundreds 5 tens $?$ ones
 $= 4$ hundreds $?$ tens 18 ones
2. $324 = 3$ hundreds 1 ten $?$ ones
 $= 2$ hundreds $?$ tens 14 ones
3. $601 = ?$ hundreds 10 tens 1 one
 $= 5$ hundreds $?$ tens 11 ones

Find the missing digits.

4.
$$\begin{array}{r} \overset{4}{3} \overset{??}{5} \overset{??}{2} \\ - 198 \\ \hline ? \end{array} \quad \rightarrow \quad \begin{array}{r} \overset{2}{3} \overset{??}{5} \overset{12}{2} \\ - 198 \\ \hline ??? \end{array}$$

5.
$$\begin{array}{r} \overset{?}{7} \overset{10}{0} 5 \\ - 188 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} \overset{6}{7} \overset{10}{0} \overset{??}{5} \\ - 188 \\ \hline ??? \end{array}$$

Use the whole number example to find the amount of money.

6.
$$\begin{array}{r} \overset{9}{5} \overset{10}{0} 0 \\ - 324 \\ \hline \end{array} \quad \begin{array}{r} \$5.00 \\ - 3.24 \\ \hline \end{array}$$

7.
$$\begin{array}{r} \overset{9}{6} \overset{10}{0} 0 \\ - 478 \\ \hline \end{array} \quad \begin{array}{r} \$6.00 \\ - 4.78 \\ \hline \end{array}$$

Solve.

- *8.
$$\begin{array}{r} 842 \\ - 357 \\ \hline \end{array}$$
 9.
$$\begin{array}{r} 753 \\ - 269 \\ \hline \end{array}$$
 10.
$$\begin{array}{r} 607 \\ - 438 \\ \hline \end{array}$$
 11.
$$\begin{array}{r} 817 \\ - 59 \\ \hline \end{array}$$
 12.
$$\begin{array}{r} 530 \\ - 271 \\ \hline \end{array}$$
13.
$$\begin{array}{r} 227 \\ - 149 \\ \hline \end{array}$$
 14.
$$\begin{array}{r} 413 \\ - 335 \\ \hline \end{array}$$
 15.
$$\begin{array}{r} 308 \\ - 199 \\ \hline \end{array}$$
 16.
$$\begin{array}{r} 362 \\ - 178 \\ \hline \end{array}$$
 17.
$$\begin{array}{r} 240 \\ - 173 \\ \hline \end{array}$$
18.
$$\begin{array}{r} \$7.00 \\ - 4.86 \\ \hline \end{array}$$
 19.
$$\begin{array}{r} \$8.00 \\ - 2.63 \\ \hline \end{array}$$
 20.
$$\begin{array}{r} \$2.00 \\ - 1.75 \\ \hline \end{array}$$
 21.
$$\begin{array}{r} \$9.00 \\ - 8.97 \\ \hline \end{array}$$
 22.
$$\begin{array}{r} \$5.00 \\ - 1.44 \\ \hline \end{array}$$

Write an estimate first. Then find n and check.

- *23. $311 - 293 = n$ 24. $357 - 268 = n$ 25. $562 - 95 = n$
 26. $700 - 345 = n$ 27. $198 + n = 306$ 28. $483 + n = 812$

WRITING SUBTRACTION EXAMPLES CORRECTLY

- A.** Miss Scott had the class find how much more five dollars is than three dollars and forty-six cents.

$$\begin{array}{r} \$ \quad 5 \\ - 3.46 \\ \hline \end{array}$$

- Why is the first example wrong? \$5.00
 - Is this example written correctly? - 3.46
- Copy it and find the answer.

- B.** How much change will you get from a five-dollar bill if you spend \$2.45? \$.67? \$1.23? \$4.76?



EXERCISES

Find the answer and check.

- | | |
|---------------------------|----------------------------|
| *1. $\$9.00 - \$1.28 = ?$ | 2. $\$10.00 - \$1.58 = ?$ |
| 3. $\$5.00 - \$1.09 = ?$ | 4. $\$3.00 - \$2.98 = ?$ |
| 5. $\$7.00 - \$0.79 = ?$ | 6. $\$9.80 - \$3.00 = ?$ |
| 7. $\$6.00 - \$0.43 = ?$ | 8. $\$7.00 - \$2.04 = ?$ |
| 9. $\$4.98 - \$2.00 = ?$ | 10. $\$10.00 - \$0.39 = ?$ |

Estimate each answer. Then find each answer.

- | | | | | |
|---|---|--|--|--|
| *11. $\begin{array}{r} 711 \\ - 348 \\ \hline \end{array}$ | 12. $\begin{array}{r} 546 \\ - 159 \\ \hline \end{array}$ | 13. $\begin{array}{r} 483 \\ - 198 \\ \hline \end{array}$ | 14. $\begin{array}{r} 311 \\ - 274 \\ \hline \end{array}$ | 15. $\begin{array}{r} 576 \\ - 287 \\ \hline \end{array}$ |
| 16. $\begin{array}{r} \$4.67 \\ - 1.73 \\ \hline \end{array}$ | 17. $\begin{array}{r} \$6.35 \\ - 5.45 \\ \hline \end{array}$ | 18. $\begin{array}{r} \$5.45 \\ - .55 \\ \hline \end{array}$ | 19. $\begin{array}{r} \$3.88 \\ - .90 \\ \hline \end{array}$ | 20. $\begin{array}{r} \$9.57 \\ - .58 \\ \hline \end{array}$ |
| *21. $\begin{array}{r} 700 \\ - 375 \\ \hline \end{array}$ | 22. $\begin{array}{r} 400 \\ - 276 \\ \hline \end{array}$ | 23. $\begin{array}{r} 800 \\ - 483 \\ \hline \end{array}$ | 24. $\begin{array}{r} 500 \\ - 125 \\ \hline \end{array}$ | 25. $\begin{array}{r} 600 \\ - 75 \\ \hline \end{array}$ |

26. Earl's haircut cost \$2.75. He gave the barber \$5.00.
How much change did he get?

* 1. \$7.72 11. 400; 363 21. 300; 325

TRY AN EASIER PROBLEM FIRST

A. Try this problem. If you cannot do it, try the problem in **B**.

- A book costs \$3.47. Laura has two and a half dollars. She needs ? more to buy it.



B. A model costs \$3.00. John has \$2.00. John needs ? more to buy it.

- Do you add or subtract to find the answer?
\$3.00 – \$2.00 = ?
- Go back and do the problem in **A**.



EXERCISES

If you have trouble with the problem in column **A**, do the problem in column **B**. Then go back and try the problem in column **A** again.

A

1. Bob had \$4.65 in the bank. He put in \$1.75 more. Now he has ? in the bank.
2. Mary needs 2 pairs of curtains. Each pair costs \$4.98. They will cost ? .
3. Bobo's Boat Basin has 63 boats. If 28 boats are rented, then ? are left.
4. Ken weighs 93 pounds. Al weighs 87. Ken weighs ? more pounds than Al.

B

1. 24 cookies in a jar. 12 more in a box. ? cookies in all.
2. 2 boxes of popcorn. Each costs 25¢. Both cost ? .
3. 8 slices of pizza. 5 slices eaten. ? slices left.
4. 7 shirts. 3 ties. ? more shirts.

CHECKPOINT

- ✓ Check your understanding of **key terms and phrases**.
Use each in a sentence.

unknown addend
subtract

estimate
sum

- ✓ Check your understanding of **key ideas**.

1a. Solve.

$$10 - 6 = 4 \text{ so, } 11 - 6 = n$$

$$14 - 3 = 11 \text{ so, } 20 - 3 = n$$

1b. How does the unknown addend change when the sum increases?

2a. Rename.

4 dimes 2 pennies =

3 dimes pennies

2b. How is renaming in subtraction different from renaming in addition?

3a. Rename 346.

2 hundreds tens 6 ones.

3b. One hundred is how many tens?

4a. Solve.

964	\$9.64
- 175	- 1.75

4b. How is subtracting money like subtracting whole numbers? How is it different?

- ✓ Check your **skills**.

1. 46 - 37 <u> </u>	2. 63 - 56 <u> </u>	3. 35 - 18 <u> </u>	4. 86 - 49 <u> </u>	5. 92 - 58 <u> </u>	6. 71 - 57 <u> </u>
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7. 871 - 580 <u> </u>	8. 926 - 745 <u> </u>	9. 618 - 437 <u> </u>	10. 763 - 578 <u> </u>	11. 252 - 185 <u> </u>	12. 730 - 591 <u> </u>
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13. \$6.00 - 3.35 <u> </u>	14. \$8.64 - 5.99 <u> </u>	15. \$3.52 - 1.86 <u> </u>	16. \$5.03 - 2.48 <u> </u>	17. \$7.21 - 4.57 <u> </u>	18. \$4.26 - 2.28 <u> </u>
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EXERCISES

A hundred has been renamed as 10 tens. Find n .

- * 1. 3 hundreds 2 tens = n hundreds 12 tens
2. 6 hundreds 8 tens = n hundreds 18 tens
3. 2 hundreds 7 tens = 1 hundred n tens
4. 4 hundreds 0 tens = 3 hundreds n tens
5. $430 = 300 + n$ tens
6. $900 = 800 + n$ tens
7. $270 = 100 + n$ tens
8. $400 = 300 + n$ tens
9. $320 = n$ hundreds 12 tens
10. $680 = n$ hundreds 18 tens
11. $700 = n$ hundreds 10 tens
12. $670 = n$ hundreds 17 tens
13. $560 = n$ hundreds 16 tens
14. $n = 7$ hundreds 13 tens
15. $n = 0$ hundreds 15 tens
16. $n = 2$ hundreds 14 tens

Rename each number to show 1 less hundred and 10 more tens.

- * 17. 240
18. 680
19. 910
20. 730
21. 578
22. 465
23. 356
24. 819

Copy and complete each chart to show another name for the number.

25.

	Hundreds	Tens	Ones
600	5	?	0
800	7	?	0
300	?	10	0
200	?	10	0

26.

	Hundreds	Tens	Ones
430	?	13	0
770	?	17	0
860	7	?	0
367	2	?	7

Think Twice

Find 10 sets of 3 numbers that make the sentence below true.

27. $548 = x$ hundreds y tens z ones.

Keeping Up with the Facts

1. $7 - 4 = n$
2. $15 - 6 = n$
3. $14 - 8 = n$
4. $17 - 9 = n$

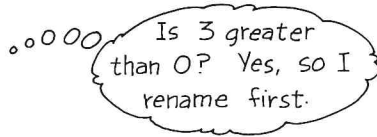
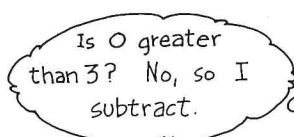
* 1. 2 17. 1 hundred 14 tens 0 ones

SUBTRACTING NUMBERS NAMED BY THREE DIGITS

A. How does Jody decide if she needs to rename?

$$\begin{array}{r} 435 \\ -104 \\ \hline ?1 \end{array}$$

$$\begin{array}{r} 405 \\ -134 \\ \hline ?1 \end{array}$$



B. Here is the way Jody solves $405 - 134 = n$.

$$\begin{array}{r} 405 \\ -134 \\ \hline 1 \end{array}$$



$$\begin{array}{r} \textcolor{red}{3} \text{ } 10 \\ 405 \\ -134 \\ \hline 71 \end{array}$$



$$\begin{array}{r} \textcolor{red}{3} \text{ } 10 \\ 405 \\ -134 \\ \hline \textcolor{red}{2} 71 \end{array}$$

Compare the ones.
Subtract.
Compare the tens.

Rename a hundred
as 10 tens.
Subtract.

Subtract
the
hundreds.

■ Use addition to check Jody's answer.

C. How has the sum been renamed? Why was it renamed?

$$\begin{array}{r} \textcolor{red}{5} \text{ } 10 \\ 607 \\ -483 \\ \hline \end{array}$$

$$\begin{array}{r} \textcolor{red}{3} \text{ } 12 \\ 428 \\ -143 \\ \hline \end{array}$$

$$\begin{array}{r} \textcolor{red}{4} \text{ } 10 \\ 506 \\ -392 \\ \hline \end{array}$$

$$\begin{array}{r} \textcolor{red}{8} \text{ } 13 \\ 936 \\ -385 \\ \hline \end{array}$$

D. In which of these examples do you need to rename a hundred as 10 tens?

$$\begin{array}{r} 326 \\ -125 \\ \hline \end{array}$$

$$\begin{array}{r} 326 \\ -135 \\ \hline \end{array}$$

$$\begin{array}{r} 830 \\ -260 \\ \hline \end{array}$$

$$\begin{array}{r} 860 \\ -230 \\ \hline \end{array}$$

$$\begin{array}{r} 326 \\ -180 \\ \hline \end{array}$$

■ When do you need to rename a hundred in subtraction?

NUMBER SENTENCES

- A.** There are 9 children playing on the jungle gym. If 6 of them are boys, how many are girls?

- What added to 6 is 9?

$$6 + n = 9$$

- Can you also use $9 - 6 = n$ to find the answer?



- B.** Billy has 3 long-sleeved shirts and 4 short-sleeved shirts. How many shirts is that?

- Can you use $3 + 4 = n$ to find the answer?
- Write another number sentence you could use.

EXERCISES

A number sentence is given for each problem. Write another sentence to use to solve the problem. Then solve the problem.

- Joyce is 8 years old today. She has 2 candles for her birthday cake. How many more does she need?
 $2 + n = 8$
- Ken has 8 pet gerbils. If 3 are male, how many are female?
 $3 + n = 8$
- Anne has a nickel and 9 pennies. How much money is that?
 $5 + 9 = n$
- In a game, Gay tossed two bags of beans. Her scores were 7 and 6. What was her total score?
 $7 + 6 = n$
- Ella babysat from 2 o'clock until 6 o'clock. How many hours is that?
 $2 + n = 6$
- Of 13 boats, 4 are canoes. The others are rowboats. How many are rowboats?
 $13 - 4 = n$

KEEPING UP IN MATHEMATICS

Find the answers. [68-72]

$$\begin{array}{r} 1. \quad 56 \\ + 25 \\ \hline \end{array} \quad \begin{array}{r} 2. \quad 69 \\ + 33 \\ \hline \end{array} \quad \begin{array}{r} 3. \quad 48 \\ + 18 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 49 \\ + 26 \\ \hline \end{array} \quad \begin{array}{r} 5. \quad 62 \\ + 19 \\ \hline \end{array} \quad \begin{array}{r} 6. \quad 49 \\ + 34 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 25 \\ + 93 \\ \hline \end{array} \quad \begin{array}{r} 8. \quad 32 \\ + 81 \\ \hline \end{array} \quad \begin{array}{r} 9. \quad 45 \\ + 72 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 284 \\ + 245 \\ \hline \end{array} \quad \begin{array}{r} 11. \quad 420 \\ + 386 \\ \hline \end{array} \quad \begin{array}{r} 12. \quad 456 \\ + 253 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 93 \\ + 57 \\ \hline \end{array} \quad \begin{array}{r} 14. \quad 76 \\ + 44 \\ \hline \end{array} \quad \begin{array}{r} 15. \quad 68 \\ + 32 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 289 \\ + 62 \\ \hline \end{array} \quad \begin{array}{r} 17. \quad 357 \\ + 264 \\ \hline \end{array} \quad \begin{array}{r} 18. \quad 293 \\ + 309 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 542 \\ + 158 \\ \hline \end{array} \quad \begin{array}{r} 20. \quad 137 \\ + 684 \\ \hline \end{array} \quad \begin{array}{r} 21. \quad 475 \\ + 235 \\ \hline \end{array}$$

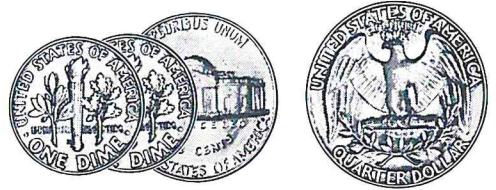
Show three subsets of each set.

[1]

$$22. \{ \bigcirc \quad \triangle \quad \square \}$$

$$23. \{ \square \quad \text{oval} \quad \text{I} \}$$

Answer each question. [17]



24. You buy a 10¢ candy in a machine. You put in 25¢. How much change do you get?

25. Put a dime in the telephone. Then dial the number. The operator says, "Ten cents more, please." How much is the call?

Answer each question. [18-19]



26. You start at 4:30. You practice for 45 minutes. What time do you stop?

27. Cookies bake in 30 minutes. Start the cookies at 2:30. At what time are they baked?

28. The meeting starts at 6:00. You are 15 minutes early. What time is it?

MONEY

A. A *quarter* is one fourth of a dollar.
It is worth 25 cents.

- How many quarters are worth as much as 1 dollar?



B. A *half dollar* is one half of a dollar.
It is worth 50 cents.

- How many half dollars are worth as much as 1 dollar?
- How many quarters are worth as much as 1 half dollar?



C. You can show a *dollar* with

- a dollar sign and cents point. \$1.00
- a cents sign. 100¢

✓ Show each of these amounts two ways.

- One dollar and fifty cents.
- Two dollars and a quarter.



EXERCISES

How many pennies are worth as much as

- * 1. 3 quarters?
2. a half dollar and a quarter?
3. a dollar?
4. a dollar and 2 quarters?

You have a quarter. How much will you have left if you spend

- * 5. 5¢?
6. 15¢?
7. 20¢?
8. 10¢?
9. 8¢?

You have a half dollar. How much will you have left if you spend

- * 10. 25¢?
11. 40¢?
12. 45¢?
13. 15¢?
14. 20¢?

-
- * 1. 75 5. 20¢ 10. 25¢

TELLING TIME

A. What part of the clock is red?

It is **half past** the hour.

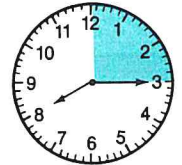
- How many minutes make a half hour?



B. What part of the clock is blue?

It is a **quarter past** the hour.

- How many minutes make a quarter hour?



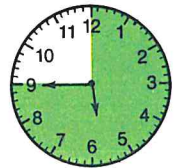
C. What part of the clock is green?

- How many minutes make 3 quarters of an hour?

- What part is white?

It is a **quarter of** the hour.

- How many minutes before the hour is a quarter of the hour?



EXERCISES

Between what two numerals is the hour hand pointing at

- | | |
|--------------------------|-------------------------------|
| *1. a quarter past four? | 2. a quarter of ten? |
| 3. half past eleven? | 4. fifteen before two? |
| 5. nine forty-five? | 6. thirty minutes before one? |

At what numeral does the minute hand point at

- | | |
|----------------------------|-----------------------------|
| *7. a quarter of any hour? | 8. a quarter past any hour? |
| 9. any half hour? | 10. any hour? |

Tell the time for each clock. Then write the time.

*11.



12.



13.



14.



* 1. 4 and 5 7. 9 11. Fifteen minutes past six. 6:15

ROMAN NUMERALS

A. The red figures on the clock are called **Roman numerals**.

- What time does the clock show?
- What hour is it when the short hand points to I? II? III? IV? V? VI? VII? VIII? IX? X? XI? XII?



B. Since $V = 5$ and $I = 1$, then $VI = 1$ more than 5 or ?.

- What number is named by VII? by VIII?
- What number is named by X? by XI? by XII?

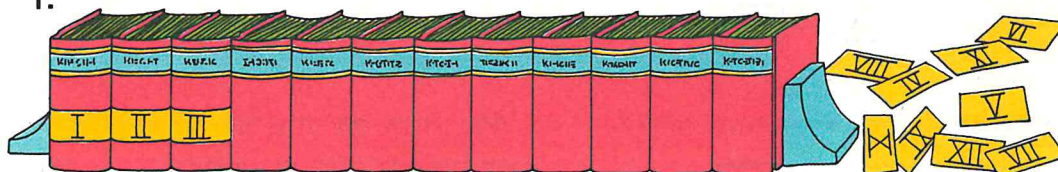
C. Since $I = 1$ and $V = 5$, then $IV = 1$ less than 5 or ?.

- How are IV and VI alike? How are they different?
- What number is named by IX? by XI?

EXERCISES

How would you complete the labeling of this set of books?

1.



Write the Roman numeral that shows

- | | |
|--------------------|--------------------|
| *2. 1 more than 1. | 3. 2 more than 1. |
| 4. 2 more than 5. | 5. 3 more than 5. |
| 6. 1 more than 10. | 7. 2 more than 10. |

Write the Roman numeral that shows

- | | |
|-------------------|--------------------|
| 8. 1 less than 5. | 9. 1 less than 10. |
|-------------------|--------------------|

* 2. II

CHECKPOINT

✓ Check your understanding of **key terms and phrases**.

Use each in a sentence.

closed surface	fraction	line segment
number pair	simple closed path	congruent
fractional number	ellipse	plane region
point	Roman numerals	temperature

✓ Check your understanding of **key ideas**.

1a. Draw a simple closed path.
Show a point outside the path
and a line segment inside it.

1b. When is a point inside a
simple closed path? on it?
outside it?

2a. Is the red region congruent
to the blue region?



2b. How can you tell if
two regions are congruent?

3a. Write a number pair for
the pieces that are shaded.



3b. What does a number
pair tell about a region?

4a. What is the measure of A?



4b. How do you find the
measure of a region?

✓ Check your **skills**.

1. What is the measure of \overline{AB} in inches?



2. What is the measure of \overline{CD} in centimeters?



UNIT TEST

Find the answers.

1. What is the measure of \overline{AB} ?



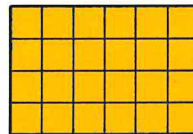
2. Which figure is congruent to the figure in red?



3. Which is worth more?

a. A half dollar. b. A quarter and 4 pennies.

4. Think of each square as a unit region. What is the measure of the region in square units?



5. Peter made a rectangle out of straws. How many straws did he use?

6. What fractional number tells the part of the figure that is red?



7. There are 8 pints in a gallon. How many pints in two gallons?

8. The temperature was 50° at 9 o'clock. It was 65° at noon.

How much warmer was it at noon?

9. What time is shown on the clock?



10. The ball game started at 8:00 P.M. It ended at 11:00 P.M.

How many hours did the game last?

If you have time, try these.

11. How much greater is the number VI than the number IV?
12. How much less is the number VII than the number XII?

INQUIRY INTO GEOMETRY

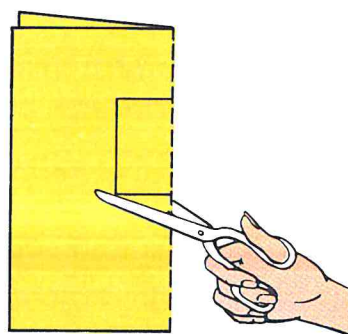
Paper Folding

You can cut out many geometric shapes from a folded sheet of paper. Try to guess what shape each cutout will be when you unfold it.

- When you cut, be sure to start and end on the fold.

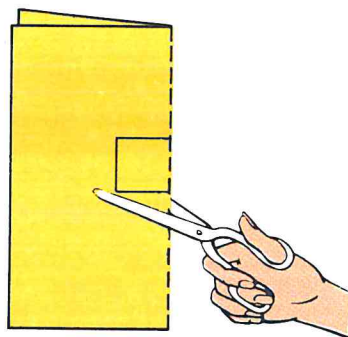
A RECTANGULAR REGION

- Fold a sheet of paper.
Cut out a **rectangular region**.
Now unfold.
What shape is the cutout?
Was your guess correct?
- Cut out a smaller rectangular region.
Cut out a larger rectangular region.
What shape do you always get
when you unfold?
Compare the size of the folded
cutout and unfolded cutout.



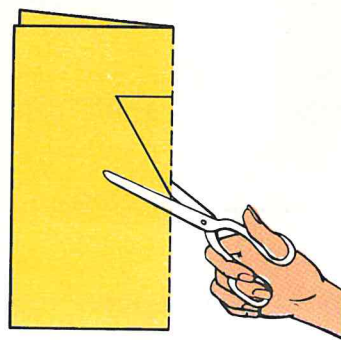
A SQUARE REGION

- Fold a sheet of paper.
Cut out a **square region**.
Unfold the cutout.
What shape is it?
- Cut out a rectangular region
from a folded sheet of paper
so that the unfolded cutout will be a square region.

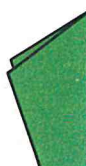


A TRIANGULAR REGION

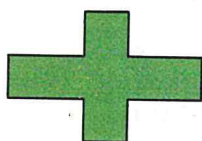
- Cut out a **triangular region** as shown in the drawing. What shape is the unfolded region?
- Find a way to cut out a triangular region to get a region that when unfolded is not a triangular region.



Guess what shape each cutout below will be when you unfold it. Check to see if your guess is correct.

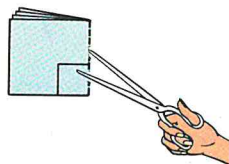
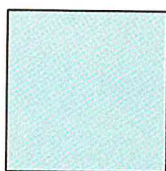


Cut out regions from a folded sheet of paper that will look like the regions below when unfolded.



For Further Inquiry

- Fold a sheet of paper twice. Cut out a square region as shown in the drawing. Guess what shape the cutout will be when you unfold it.



- Fold a sheet of paper twice and cut out a region that will be square when unfolded. Use just one cut.

PATTERNS IN SUBTRACTION

A. Look for a pattern.

Sum	s	8	10	12	14	16	18	20
Known Addend	k	-2	-2	-2	-2	-2	-2	-2
Unknown Addend	$s - k$	$\frac{6}{}$	$\frac{8}{}$	$\frac{10}{}$	$\frac{12}{}$	$\frac{14}{}$	$\frac{16}{}$	$\frac{18}{}$

- As you move to the right, does s remain the same?
Does it decrease? Does it increase?
As you move to the right, what do you notice about k ?
As you move to the right, what do you notice about $s - k$?
- Make a rule. When the sum increases and the known addend does not change, what happens to the unknown addend?

B. Look for a pattern.

s	38	38	38	38	38	38	38	38
k	-0	-2	-4	-6	-8	-10	-12	-14
$s - k$	$\frac{38}{}$	$\frac{36}{}$	$\frac{34}{}$	$\frac{32}{}$	$\frac{30}{}$	$\frac{28}{}$	$\frac{26}{}$	$\frac{24}{}$

- What do you notice about s ? about k ? about $s - k$?
- Make a rule. When the known addend increases and the sum does not change, what happens to the unknown addend?

C. Look for a pattern.

s	10	12	14	16	18	20	22	24
k	-3	-5	-7	-9	-11	-13	-15	-17
$s - k$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$	$\frac{7}{}$

- As s increases, what happens to k ?
How do the increases compare?
What do you notice about $s - k$?
- Make a rule. When the sum and known addend both increase by the same number, what happens to the unknown addend?

EXERCISES

Copy and complete. What patterns do you notice?

1.	s	9	11	13	15	17	19
	k	-2	-2	-2	-2	-2	-2
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

2.	s	10	20	30	40	50	60
	k	-6	-16	-26	-36	-46	-56
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

3.	s	38	38	38	38	38	38
	k	-5	-10	-15	-20	-25	-30
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

Replace \bullet with $<$, $=$, or $>$. Use the patterns you have discovered.

- *4. Since $14 - 9 = 5$, then $15 - 10 \bullet 5$.
- 5. Since $10 - 2 = 8$, then $10 - 6 \bullet 8$.
- 6. Since $53 - 27 = 26$, then $53 - 37 \bullet 26$.
- 7. Since $36 - 20 = 16$, then $46 - 20 \bullet 16$.
- 8. Since $46 - 19 = 27$, then $56 - 29 \bullet 27$.
- *9. Since $896 - 674 = 222$, then $900 - 674 \bullet 222$.
- 10. Since $496 - 50 = 446$, then $496 - 100 \bullet 446$.
- 11. Since $867 - 260 = 607$, then $967 - 360 \bullet 607$.

Think Twice

Solve each sentence using the patterns you have discovered.

- 12. $47 - 22 = 25$, so $50 - \square = 28$.
- 13. $23 - 14 = 9$, so $\square - 18 = 5$.
- 14. $30 - 25 = 5$, so $35 - \square = 5$.
- 15. $196 - 150 = 46$, so $\square - 160 = 36$.

* 4. = 9. >

ESTIMATING IN SUBTRACTION

A. Look at the hundreds in the example at the right.

■ $7 - 2 = 5$, so $700 - 200 = 500$

- Compare 82 with 82.

Is 82 less than, equal to,
or greater than 82?

- Why is n equal to exactly 500?

$$782 - 282 = n$$

$$700 - 200 = 500$$

$$82 = 82$$

$$\text{So } n = 500$$

B. Look at the hundreds in the example at the right.

■ $700 - 200 = \underline{\quad ? \quad}$

- Compare 82 with 35.

Is 82 less than, equal to,
or greater than 35?

- Why is n greater than 500?

Then n is equal to 500-some.

$$782 - 235 = n$$

$$700 - 200 = 500$$

$$82 > 35$$

$$\text{So } 782 - 235 > 500$$

$$782 - 235 \text{ is } 500\text{-some}$$

C. Look at the hundreds in the example at the right.

- How are they like the
hundreds in **A**? **B**?

- Compare 82 with 97.

Is 82 less than, equal to,
or greater than 97?

- Why is n less than 500?

Why is n equal to 400-some?

$$782 - 297 = n$$

$$700 - 200 = 500$$

$$82 < 97$$

$$\text{So } 782 - 297 < 500$$

$$782 - 297 \text{ is } 400\text{-some}$$

EXERCISES

Write the correct hundred.

*1. $726 - 426 = 300$

$$730 - 426 \text{ is } 300\text{-some}$$

$$720 - 426 \text{ is } \underline{\quad ? \quad}\text{-some}$$

2. $953 - 553 = 400$

$$953 - 552 \text{ is } \underline{\quad ? \quad}\text{-some}$$

$$953 - 554 \text{ is } \underline{\quad ? \quad}\text{-some}$$

* 1. 200-some

Replace ● with <, =, or >.

- *3. $700 - 300 \bullet 400$ 4. $900 - 200 \bullet 500$ 5. $735 - 535 \bullet 200$
 $735 - 300 \bullet 400$ $967 - 200 \bullet 500$ $752 - 535 \bullet 200$
 $700 - 335 \bullet 400$ $900 - 267 \bullet 500$ $735 - 552 \bullet 200$

Write the hundreds for n .

Example: $653 - 350 = n$ Answer: $n = 300$ -some

- *6. $275 - 173 = n$ 7. $263 - 65 = n$ 8. $225 - 27 = n$
9. $237 - 35 = n$ 10. $237 - 39 = n$ 11. $263 - 63 = n$
12. $257 - 54 = n$ 13. $357 - 160 = n$ 14. $193 - 90 = n$
15. $493 - 95 = n$ 16. $373 - 171 = n$ 17. $473 - 175 = n$
18. $260 - 62 = n$ 19. $560 - 57 = n$ 20. $490 - 250 = n$
21. $490 - 295 = n$ 22. $873 - 71 = n$ 23. $873 - 75 = n$
24. $962 - 75 = n$ 25. $962 - 475 = n$ 26. $962 - 775 = n$

Think Twice

Which is greater?

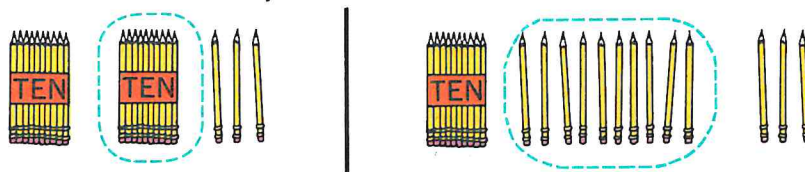
27. $975 - 163$ or $975 - 167$ 28. $737 - 142$ or $757 - 135$
29. $\textcircled{2}\textcircled{2}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0} - \textcircled{2}\textcircled{0}\textcircled{0}$ or $\textcircled{2}\textcircled{2}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0} - \textcircled{2}\textcircled{0}\textcircled{0}\textcircled{0}$

Keeping Up with the Facts

- | | | | | | |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 8 \\ +4 \\ \hline \end{array}$ | 2. $\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$ | 5. $\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$ | 6. $\begin{array}{r} 5 \\ +0 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ | 8. $\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$ | 9. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ | 10. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ | 11. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 12. $\begin{array}{r} 13 \\ -5 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 11 \\ -5 \\ \hline \end{array}$ | 14. $\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$ | 15. $\begin{array}{r} 15 \\ -9 \\ \hline \end{array}$ | 16. $\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$ | 17. $\begin{array}{r} 13 \\ -8 \\ \hline \end{array}$ | 18. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$ |

* 3. =; >; < 6. 100-some

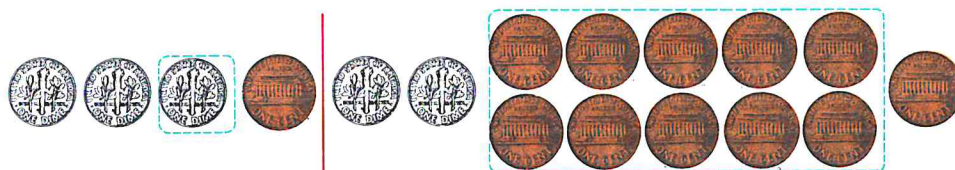
RENAMING A TEN AS ONES



A. Both pictures show the same number of pencils, 23.

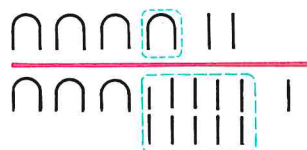
- The picture at the left shows 2 tens 3 ones.
- In the picture at the right, 1 bundle of 10 has been opened. The picture shows 1 ten ones.

B. Both pictures below show the same amount of money, 31¢.

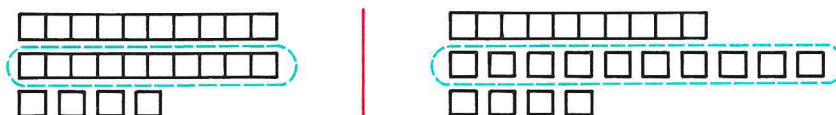


- The picture at the left shows dimes pennies.
- In the picture at the right, 1 dime has been changed for pennies. The picture shows dimes pennies.

C. A heelbone at the right has been renamed with strokes. Name the number shown in two ways.



D. One strip of ten blocks has been separated into single blocks. Name the number shown in two ways.



- ✓ In **A**, **B**, **C**, and **D** above, 1 ten was renamed as ones.
Each number was renamed as less ten and more ones.

EXERCISES

A ten has been renamed as 10 ones. Find n .

- | | |
|--------------------------------------|--------------------------|
| *1. 7 tens 2 ones = n tens 12 ones | 2. $37 = n$ tens 17 ones |
| 3. 6 tens 0 one = n tens 10 ones | 4. $79 = n$ tens 19 ones |
| 5. 3 tens 4 ones = n tens 14 ones | 6. $29 = n$ tens 19 ones |
| 7. $46 = n + 16$ | 8. $52 = n + 12$ |
| 10. $87 = n + 17$ | 12. $99 = n + 19$ |
| | 9. $17 = n + 17$ |

A ten has been renamed as 10 ones. Find n .

- | | |
|--------------------------------------|----------------------------|
| *13. 5 tens 3 ones = 4 tens n ones | 14. $62 = 5$ tens n ones |
| 15. 7 tens 9 ones = 6 tens n ones | 16. $82 = 7$ tens n ones |
| 17. 4 tens 0 ones = 3 tens n ones | 18. $59 = 4$ tens n ones |
| 19. $33 = 20 + n$ | 21. $68 = 50 + n$ |
| 22. $97 = 80 + n$ | 24. $23 = 10 + n$ |
| 20. $75 = 60 + n$ | 23. $70 = 60 + n$ |

Each number has been renamed. Find n .

- | | |
|--|--------------------------|
| *25. 2 hundreds 5 tens 7 ones = 2 hundreds 4 tens n ones | |
| 26. 7 hundreds 2 tens 0 ones = 7 hundreds n tens 10 ones | |
| 27. $340 = 300 + 30 + n$ | 28. $270 = 200 + n + 10$ |
| 29. $968 = 900 + 50 + n$ | 30. $321 = 300 + n + 11$ |

Rename each number to show 1 less ten and 10 more ones.

- | | | |
|--------------------|-------------------|-------------------|
| *31. 7 tens 2 ones | 32. 3 tens 5 ones | 33. 8 tens 0 ones |
| *34. 86 | 35. 92 | 36. 80 |
| 37. 68 | 38. 70 | |
| 39. 123 | 40. 247 | 41. 761 |
| | | 42. 873 |
| | | 43. 267 |

Keeping Up with the Facts

- | | | | | | |
|--|--|--|--|--|--|
| 1. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ | 2. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 13 \\ -6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ | 5. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 6. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ |
|--|--|--|--|--|--|

SUBTRACTING NUMBERS NAMED BY TWO DIGITS

- A.** Neal has 46 clips. He uses 27.
Can you tell how many he has left?



- Compare the ones.
Is 7 greater than 6?
Then is $6 - 7$ a whole number?
- You must rename the sum, 46.

$$\begin{array}{r} 46 \\ -27 \\ \hline \end{array}$$

- B.** Here are two ways to show the renaming of the sum.

a.

$$\begin{array}{r} \\ \cancel{4} \text{ tens } \cancel{6} \text{ ones} \\ -2 \text{ tens } 7 \text{ ones} \\ \hline 1 \text{ ten } 9 \text{ ones, or } 19 \end{array}$$

b.

$$\begin{array}{r} \\ \cancel{4} \cancel{6} \\ -27 \\ \hline 19 \end{array}$$

- In each way, 1 ten was renamed as ? ones.
Add the 10 ones to the 6 ones to get ? ones.
- Now subtract the ones. $16 - 7 = \underline{\quad}$
Then subtract the tens. $3 \text{ tens} - 2 \text{ tens} = \underline{\quad}$ ten
- What is the answer?

- C.** You can check subtraction
by using addition.

Example *Check*

$$\begin{array}{r} 46 \\ -27 \\ \hline 19 \end{array} \qquad \begin{array}{r} 19 \\ +27 \\ \hline ?? \end{array}$$

- Is the sum in the check the
same as the sum in the example?

EXERCISES

Rename each as 1 less ten and 10 more ones.

- | | | | | | |
|-----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| $ $ | $ $ | $ $ | $ $ | $ $ | $ $ |
| *1. $\cancel{8} \cancel{4}$ | 2. $\cancel{9} \cancel{3}$ | 3. $\cancel{7} \cancel{4}$ | 4. $\cancel{7} \cancel{0}$ | 5. $\cancel{6} \cancel{5}$ | 6. $\cancel{5} \cancel{7}$ |

*1. 7

Copy and complete. Then give the simplest name for the answer.

$$\begin{array}{r} \overset{6}{7} \text{ tens } \overset{14}{4} \text{ ones} \\ - 3 \text{ tens } 8 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} \overset{8}{9} \text{ tens } \overset{??}{0} \text{ ones} \\ - 7 \text{ tens } 9 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} \overset{?}{6} \text{ tens } \overset{??}{2} \text{ ones} \\ - 2 \text{ tens } 5 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

Copy and complete.

$$\begin{array}{r} \overset{3}{4} \overset{16}{6} \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{6} \overset{??}{0} \\ - 32 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{2} \overset{??}{8} \\ - 139 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{?}{4} \overset{10}{7} \overset{?}{0} \\ - 197 \\ \hline \end{array}$$

Copy. Find the answer by any way you wish.

$$\begin{array}{r} 14. \quad 70 \\ - 35 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 75 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 44 \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} 17. \quad 73 \\ - 25 \\ \hline \end{array}$$

$$\begin{array}{r} 18. \quad 68 \\ - 26 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 81 \\ - 49 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \quad 50 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 21. \quad 70 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 22. \quad 72 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 23. \quad 65 \\ - 48 \\ \hline \end{array}$$

$$\begin{array}{r} 24. \quad 52 \\ - 28 \\ \hline \end{array}$$

$$\begin{array}{r} 25. \quad 45 \\ - 28 \\ \hline \end{array}$$

Write an estimate first. Then copy and find the unknown addend.

$$\begin{array}{r} 26. \quad 73 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 27. \quad 85 \\ - 27 \\ \hline \end{array}$$

$$\begin{array}{r} 28. \quad 45 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 29. \quad 53 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 30. \quad 95 \\ - 27 \\ \hline \end{array}$$

$$\begin{array}{r} 31. \quad 435 \\ - 127 \\ \hline \end{array}$$

$$\begin{array}{r} 32. \quad 774 \\ - 350 \\ \hline \end{array}$$

$$\begin{array}{r} 33. \quad 684 \\ - 349 \\ \hline \end{array}$$

$$\begin{array}{r} 34. \quad 391 \\ - 258 \\ \hline \end{array}$$

$$\begin{array}{r} 35. \quad 495 \\ - 169 \\ \hline \end{array}$$

Use the addition check to find if the answers are correct.

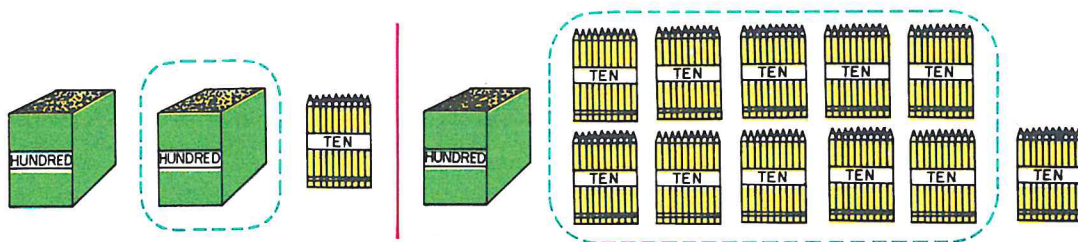
$$\begin{array}{r} 36. \quad 120 \\ - 59 \\ \hline 61 \end{array}$$

$$\begin{array}{r} 37. \quad 133 \\ - 48 \\ \hline 95 \end{array}$$

$$\begin{array}{r} 38. \quad 443 \\ - 27 \\ \hline 406 \end{array}$$

$$\begin{array}{r} 39. \quad 75 \\ - 36 \\ \hline 39 \end{array}$$

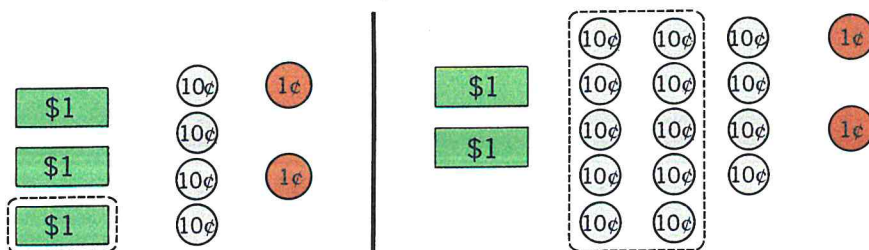
RENAMING A HUNDRED AS TENS



A. Both pictures above show the same number of pencils, 210.

- The picture at the left shows 2 hundreds 1 ten.
- In the picture at the right, 1 box of 100 has been opened.
The picture shows ? hundred ? tens.
- 2 hundreds 1 ten = 1 hundred ? tens.

B. How is the picture at the right below different from the one at the left? How are they alike?



- 3 dollars 4 dimes 2 pennies = 2 dollars ? dimes 2 pennies.
- $342 = 200 + \underline{\quad} + 2$

C. A coiled rope below has been renamed as 10 heelbones.



- $222 = 100 + \underline{\quad} + 2$

✓ In **A**, **B**, and **C** above, 1 hundred was renamed as ? tens.
Each number was renamed as ? less hundred and ? more tens.

EXERCISES

- *1. $568 = 5 \text{ hundreds } 5 \text{ tens } \underline{\quad} \text{ ones}$
 $= 4 \text{ hundreds } \underline{\quad} \text{ tens } 18 \text{ ones}$
 2. $324 = 3 \text{ hundreds } 1 \text{ ten } \underline{\quad} \text{ ones}$
 $= 2 \text{ hundreds } \underline{\quad} \text{ tens } 14 \text{ ones}$
 3. $601 = \underline{\quad} \text{ hundreds } 10 \text{ tens } 1 \text{ one}$
 $= 5 \text{ hundreds } \underline{\quad} \text{ tens } 11 \text{ ones}$

Find the missing digits.

4.
$$\begin{array}{r} \overset{4 \text{ ??}}{3 \cancel{5} 2} \\ -198 \\ \hline ? \end{array} \quad \rightarrow \quad \begin{array}{r} \overset{2 \text{ ??}}{\cancel{4} 12} \\ \cancel{3} 5 2 \\ -198 \\ \hline ? ? ? \end{array}$$

5.
$$\begin{array}{r} \overset{? \text{ 10}}{\cancel{7} 0 5} \\ -188 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} \overset{? \text{ ??}}{\cancel{6} 10} \\ \cancel{7} 0 5 \\ -188 \\ \hline ? ? ? \end{array}$$

Use the whole number example to find the amount of money.

6.
$$\begin{array}{r} \overset{9 \text{ 10}}{\cancel{4} 10} \\ \cancel{5} 0 0 \\ -324 \\ \hline \end{array} \quad \begin{array}{r} \$5.00 \\ -3.24 \\ \hline \end{array}$$

7.
$$\begin{array}{r} \overset{9 \text{ 10}}{\cancel{5} 10} \\ \cancel{6} 0 0 \\ -478 \\ \hline \end{array} \quad \begin{array}{r} \$6.00 \\ -4.78 \\ \hline \end{array}$$

Solve.

- *8.
$$\begin{array}{r} 842 \\ -357 \\ \hline \end{array}$$
 9.
$$\begin{array}{r} 753 \\ -269 \\ \hline \end{array}$$
 10.
$$\begin{array}{r} 607 \\ -438 \\ \hline \end{array}$$
 11.
$$\begin{array}{r} 817 \\ -59 \\ \hline \end{array}$$
 12.
$$\begin{array}{r} 530 \\ -271 \\ \hline \end{array}$$
13.
$$\begin{array}{r} 227 \\ -149 \\ \hline \end{array}$$
 14.
$$\begin{array}{r} 413 \\ -335 \\ \hline \end{array}$$
 15.
$$\begin{array}{r} 308 \\ -199 \\ \hline \end{array}$$
 16.
$$\begin{array}{r} 362 \\ -178 \\ \hline \end{array}$$
 17.
$$\begin{array}{r} 240 \\ -173 \\ \hline \end{array}$$
18.
$$\begin{array}{r} \$7.00 \\ -4.86 \\ \hline \end{array}$$
 19.
$$\begin{array}{r} \$8.00 \\ -2.63 \\ \hline \end{array}$$
 20.
$$\begin{array}{r} \$2.00 \\ -1.75 \\ \hline \end{array}$$
 21.
$$\begin{array}{r} \$9.00 \\ -8.97 \\ \hline \end{array}$$
 22.
$$\begin{array}{r} \$5.00 \\ -1.44 \\ \hline \end{array}$$

Write an estimate first. Then find n and check.

- *23. $311 - 293 = n$ 24. $357 - 268 = n$ 25. $562 - 95 = n$
 26. $700 - 345 = n$ 27. $198 + n = 306$ 28. $483 + n = 812$

* 1. 18; 15 8. 485 23. 0; 18

WRITING SUBTRACTION EXAMPLES CORRECTLY

- A.** Miss Scott had the class find how much more five dollars is than three dollars and forty-six cents.

$$\begin{array}{r} \$5 \\ - 3.46 \\ \hline \end{array}$$

- Why is the first example wrong? $\$5.00$
 - Is this example written correctly? $\begin{array}{r} - 3.46 \\ \hline \end{array}$
- Copy it and find the answer.

- B.** How much change will you get from a five-dollar bill if you spend \$2.45? \$.67? \$1.23? \$4.76?



EXERCISES

Find the answer and check.

- | | |
|---------------------------|----------------------------|
| *1. $\$9.00 - \$1.28 = ?$ | 2. $\$10.00 - \$1.58 = ?$ |
| 3. $\$5.00 - \$1.09 = ?$ | 4. $\$3.00 - \$2.98 = ?$ |
| 5. $\$7.00 - \$0.79 = ?$ | 6. $\$9.80 - \$3.00 = ?$ |
| 7. $\$6.00 - \$0.43 = ?$ | 8. $\$7.00 - \$2.04 = ?$ |
| 9. $\$4.98 - \$2.00 = ?$ | 10. $\$10.00 - \$0.39 = ?$ |

Estimate each answer. Then find each answer.

- | | | | | |
|---|---|--|--|--|
| *11. $\begin{array}{r} 711 \\ - 348 \\ \hline \end{array}$ | 12. $\begin{array}{r} 546 \\ - 159 \\ \hline \end{array}$ | 13. $\begin{array}{r} 483 \\ - 198 \\ \hline \end{array}$ | 14. $\begin{array}{r} 311 \\ - 274 \\ \hline \end{array}$ | 15. $\begin{array}{r} 576 \\ - 287 \\ \hline \end{array}$ |
| 16. $\begin{array}{r} \$4.67 \\ - 1.73 \\ \hline \end{array}$ | 17. $\begin{array}{r} \$6.35 \\ - 5.45 \\ \hline \end{array}$ | 18. $\begin{array}{r} \$5.45 \\ - .55 \\ \hline \end{array}$ | 19. $\begin{array}{r} \$3.88 \\ - .90 \\ \hline \end{array}$ | 20. $\begin{array}{r} \$9.57 \\ - .58 \\ \hline \end{array}$ |
| *21. $\begin{array}{r} 700 \\ - 375 \\ \hline \end{array}$ | 22. $\begin{array}{r} 400 \\ - 276 \\ \hline \end{array}$ | 23. $\begin{array}{r} 800 \\ - 483 \\ \hline \end{array}$ | 24. $\begin{array}{r} 500 \\ - 125 \\ \hline \end{array}$ | 25. $\begin{array}{r} 600 \\ - 75 \\ \hline \end{array}$ |

26. Earl's haircut cost \$2.75. He gave the barber \$5.00.
How much change did he get?

* 1. \$7.72 11. 400; 363 21. 300; 325

TRY AN EASIER PROBLEM FIRST

A. Try this problem. If you cannot do it, try the problem in **B**.

- A book costs \$3.47. Laura has two and a half dollars. She needs ? more to buy it.



B. A model costs \$3.00. John has \$2.00. John needs ? more to buy it.

- Do you add or subtract to find the answer?
\$3.00 – \$2.00 = ?
- Go back and do the problem in **A**.



EXERCISES

If you have trouble with the problem in column **A**, do the problem in column **B**. Then go back and try the problem in column **A** again.

A

1. Bob had \$4.65 in the bank. He put in \$1.75 more. Now he has ? in the bank.
2. Mary needs 2 pairs of curtains. Each pair costs \$4.98. They will cost ? .
3. Bobo's Boat Basin has 63 boats. If 28 boats are rented, then ? are left.
4. Ken weighs 93 pounds. Al weighs 87. Ken weighs ? more pounds than Al.

B

1. 24 cookies in a jar. 12 more in a box. ? cookies in all.
2. 2 boxes of popcorn. Each costs 25¢. Both cost ? .
3. 8 slices of pizza. 5 slices eaten. ? slices left.
4. 7 shirts. 3 ties. ? more shirts.

CHECKPOINT

- ✓ Check your understanding of **key terms and phrases**.
Use each in a sentence.

unknown addend
subtract

estimate
sum

- ✓ Check your understanding of **key ideas**.

1a. Solve.

$$10 - 6 = 4 \text{ so, } 11 - 6 = n$$

$$14 - 3 = 11 \text{ so, } 20 - 3 = n$$

1b. How does the unknown addend change when the sum increases?

2a. Rename.

4 dimes 2 pennies =

3 dimes pennies

2b. How is renaming in subtraction different from renaming in addition?

3a. Rename 346.

2 hundreds tens 6 ones.

3b. One hundred is how many tens?

4a. Solve.

$$\begin{array}{r} 964 \\ -175 \\ \hline \end{array} \qquad \begin{array}{r} \$9.64 \\ -1.75 \\ \hline \end{array}$$

4b. How is subtracting money like subtracting whole numbers? How is it different?

- ✓ Check your **skills**.

1. 46	2. 63	3. 35	4. 86	5. 92	6. 71
<u> -37 </u>	<u> -56 </u>	<u> -18 </u>	<u> -49 </u>	<u> -58 </u>	<u> -57 </u>

7. 871	8. 926	9. 618	10. 763	11. 252	12. 730
<u> -580 </u>	<u> -745 </u>	<u> -437 </u>	<u> -578 </u>	<u> -185 </u>	<u> -591 </u>

13. \$6.00	14. \$8.64	15. \$3.52	16. \$5.03	17. \$7.21	18. \$4.26
<u> -3.35 </u>	<u> -5.99 </u>	<u> -1.86 </u>	<u> -2.48 </u>	<u> -4.57 </u>	<u> -2.28 </u>

EXERCISES

A hundred has been renamed as 10 tens. Find n .

- * 1. 3 hundreds 2 tens = n hundreds 12 tens
2. 6 hundreds 8 tens = n hundreds 18 tens
3. 2 hundreds 7 tens = 1 hundred n tens
4. 4 hundreds 0 tens = 3 hundreds n tens
5. $430 = 300 + n$ tens
6. $900 = 800 + n$ tens
7. $270 = 100 + n$ tens
8. $400 = 300 + n$ tens
9. $320 = n$ hundreds 12 tens
10. $680 = n$ hundreds 18 tens
11. $700 = n$ hundreds 10 tens
12. $670 = n$ hundreds 17 tens
13. $560 = n$ hundreds 16 tens
14. $n = 7$ hundreds 13 tens
15. $n = 0$ hundreds 15 tens
16. $n = 2$ hundreds 14 tens

Rename each number to show 1 less hundred and 10 more tens.

- | | | | |
|-----------|---------|---------|---------|
| * 17. 240 | 18. 680 | 19. 910 | 20. 730 |
| 21. 578 | 22. 465 | 23. 356 | 24. 819 |

Copy and complete each chart to show another name for the number.

25.

	Hundreds	Tens	Ones
600	5	<u>?</u>	0
800	7	<u>?</u>	0
300	<u>?</u>	10	0
200	<u>?</u>	10	0

26.

	Hundreds	Tens	Ones
430	<u>?</u>	13	0
770	<u>?</u>	17	0
860	7	<u>?</u>	0
367	2	<u>?</u>	7

Think Twice

Find 10 sets of 3 numbers that make the sentence below true.

27. $548 = x$ hundreds y tens z ones.

Keeping Up with the Facts

- | | | | |
|----------------|-----------------|-----------------|-----------------|
| 1. $7 - 4 = n$ | 2. $15 - 6 = n$ | 3. $14 - 8 = n$ | 4. $17 - 9 = n$ |
|----------------|-----------------|-----------------|-----------------|

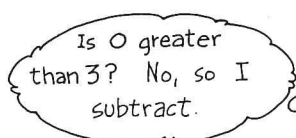
* 1. 2 17. 1 hundred 14 tens 0 ones

SUBTRACTING NUMBERS NAMED BY THREE DIGITS

A. How does Jody decide if she needs to rename?

$$\begin{array}{r} 435 \\ -104 \\ \hline ?1 \end{array}$$

$$\begin{array}{r} 405 \\ -134 \\ \hline ?1 \end{array}$$



B. Here is the way Jody solves $405 - 134 = n$.

$$\begin{array}{r} 405 \\ -134 \\ \hline 1 \end{array}$$



$$\begin{array}{r} 310 \\ 405 \\ -134 \\ \hline 71 \end{array}$$



$$\begin{array}{r} 310 \\ 405 \\ -134 \\ \hline 271 \end{array}$$

Compare the ones.
Subtract.
Compare the tens.

Rename a hundred
as 10 tens.
Subtract.

Subtract
the
hundreds.

■ Use addition to check Jody's answer.

C. How has the sum been renamed? Why was it renamed?

$$\begin{array}{r} 510 \\ 607 \\ -483 \\ \hline \end{array}$$

$$\begin{array}{r} 312 \\ 428 \\ -143 \\ \hline \end{array}$$

$$\begin{array}{r} 410 \\ 506 \\ -392 \\ \hline \end{array}$$

$$\begin{array}{r} 813 \\ 936 \\ -385 \\ \hline \end{array}$$

D. In which of these examples do you need to rename a hundred as 10 tens?

$$\begin{array}{r} 326 \\ -125 \\ \hline \end{array}$$

$$\begin{array}{r} 326 \\ -135 \\ \hline \end{array}$$

$$\begin{array}{r} 830 \\ -260 \\ \hline \end{array}$$

$$\begin{array}{r} 860 \\ -230 \\ \hline \end{array}$$

$$\begin{array}{r} 326 \\ -180 \\ \hline \end{array}$$

■ When do you need to rename a hundred in subtraction?

EXERCISES

Copy and complete. What patterns do you notice?

1.	s	9	11	13	15	17	19
	k	-2	-2	-2	-2	-2	-2
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

2.	s	10	20	30	40	50	60
	k	-6	-16	-26	-36	-46	-56
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

3.	s	38	38	38	38	38	38
	k	-5	-10	-15	-20	-25	-30
	$s - k$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$	$\underline{\quad ? \quad}$

Replace \bullet with $<$, $=$, or $>$. Use the patterns you have discovered.

*4. Since $14 - 9 = 5$, then $15 - 10 \bullet 5$.

5. Since $10 - 2 = 8$, then $10 - 6 \bullet 8$.

6. Since $53 - 27 = 26$, then $53 - 37 \bullet 26$.

7. Since $36 - 20 = 16$, then $46 - 20 \bullet 16$.

8. Since $46 - 19 = 27$, then $56 - 29 \bullet 27$.

*9. Since $896 - 674 = 222$, then $900 - 674 \bullet 222$.

10. Since $496 - 50 = 446$, then $496 - 100 \bullet 446$.

11. Since $867 - 260 = 607$, then $967 - 360 \bullet 607$.

Think Twice

Solve each sentence using the patterns you have discovered.

12. $47 - 22 = 25$, so $50 - \square = 28$.

13. $23 - 14 = 9$, so $\square - 18 = 5$.

14. $30 - 25 = 5$, so $35 - \square = 5$.

15. $196 - 150 = 46$, so $\square - 160 = 36$.

* 4. = 9. >

ESTIMATING IN SUBTRACTION

A. Look at the hundreds in the example at the right.

■ $7 - 2 = 5$, so $700 - 200 = 500$

- Compare 82 with 82.

Is 82 less than, equal to,
or greater than 82?

- Why is n equal to exactly 500?

$$782 - 282 = n$$

$$700 - 200 = 500$$

$$82 = 82$$

$$\text{So } n = 500$$

B. Look at the hundreds in the example at the right.

■ $700 - 200 = ?$

- Compare 82 with 35.

Is 82 less than, equal to,
or greater than 35?

- Why is n greater than 500?

Then n is equal to 500-some.

$$782 - 235 = n$$

$$700 - 200 = 500$$

$$82 > 35$$

$$\text{So } 782 - 235 > 500$$

$$782 - 235 \text{ is } 500\text{-some}$$

C. Look at the hundreds in the example at the right.

- How are they like the
hundreds in **A**? **B**?

- Compare 82 with 97.

Is 82 less than, equal to,
or greater than 97?

- Why is n less than 500?

Why is n equal to 400-some?

$$782 - 297 = n$$

$$700 - 200 = 500$$

$$82 < 97$$

$$\text{So } 782 - 297 < 500$$

$$782 - 297 \text{ is } 400\text{-some}$$

EXERCISES

Write the correct hundred.

* 1. $726 - 426 = 300$

$730 - 426$ is 300-some

$720 - 426$ is ?-some

2. $953 - 553 = 400$

$953 - 552$ is ?-some

$953 - 554$ is ?-some

* 1. 200-some

Replace ● with <, =, or >.

- *3. $700 - 300$ ● 400 4. $900 - 200$ ● 500 5. $735 - 535$ ● 200
 $735 - 300$ ● 400 $967 - 200$ ● 500 $752 - 535$ ● 200
 $700 - 335$ ● 400 $900 - 267$ ● 500 $735 - 552$ ● 200

Write the hundreds for n .

Example: $653 - 350 = n$ Answer: $n = 300$ -some

- *6. $275 - 173 = n$ 7. $263 - 65 = n$ 8. $225 - 27 = n$
 9. $237 - 35 = n$ 10. $237 - 39 = n$ 11. $263 - 63 = n$
 12. $257 - 54 = n$ 13. $357 - 160 = n$ 14. $193 - 90 = n$
 15. $493 - 95 = n$ 16. $373 - 171 = n$ 17. $473 - 175 = n$
 18. $260 - 62 = n$ 19. $560 - 57 = n$ 20. $490 - 250 = n$
 21. $490 - 295 = n$ 22. $873 - 71 = n$ 23. $873 - 75 = n$
 24. $962 - 75 = n$ 25. $962 - 475 = n$ 26. $962 - 775 = n$

Think Twice

Which is greater?

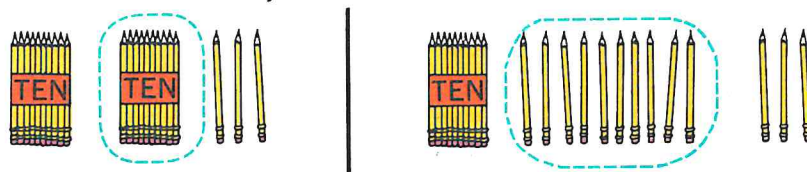
27. $975 - 163$ or $975 - 167$ 28. $737 - 142$ or $757 - 135$
 29. $\textcircled{2}\textcircled{2}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0} - \textcircled{2}\textcircled{0}\textcircled{0}$ or $\textcircled{2}\textcircled{2}\textcircled{0}\textcircled{0}\textcircled{0}\textcircled{0} - \textcircled{2}\textcircled{0}\textcircled{0}\textcircled{0}$

Keeping Up with the Facts

- | | | | | | |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 8 \\ +4 \\ \hline \end{array}$ | 2. $\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$ | 5. $\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$ | 6. $\begin{array}{r} 5 \\ +0 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ | 8. $\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$ | 9. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ | 10. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ | 11. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 12. $\begin{array}{r} 13 \\ -5 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 11 \\ -5 \\ \hline \end{array}$ | 14. $\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$ | 15. $\begin{array}{r} 15 \\ -9 \\ \hline \end{array}$ | 16. $\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$ | 17. $\begin{array}{r} 13 \\ -8 \\ \hline \end{array}$ | 18. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$ |

* 3. =; >; < 6. 100-some

RENAMING A TEN AS ONES



A. Both pictures show the same number of pencils, 23.

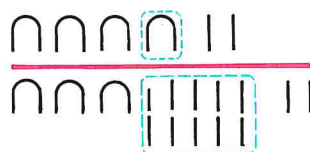
- The picture at the left shows 2 tens 3 ones.
- In the picture at the right, 1 bundle of 10 has been opened. The picture shows 1 ten ones.

B. Both pictures below show the same amount of money, 31¢.

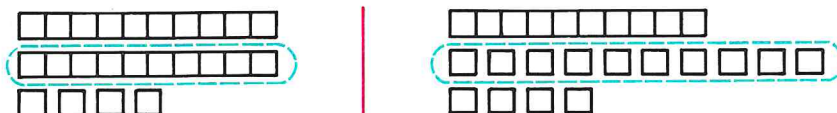


- The picture at the left shows dimes pennies.
- In the picture at the right, 1 dime has been changed for pennies. The picture shows dimes pennies.

C. A heelbone at the right has been renamed with strokes. Name the number shown in two ways.



D. One strip of ten blocks has been separated into single blocks. Name the number shown in two ways.



- ✓ In **A**, **B**, **C**, and **D** above, 1 ten was renamed as ones.
Each number was renamed as less ten and more ones.

EXERCISES

A ten has been renamed as 10 ones. Find n .

- | | |
|--------------------------------------|--------------------------|
| *1. 7 tens 2 ones = n tens 12 ones | 2. $37 = n$ tens 17 ones |
| 3. 6 tens 0 one = n tens 10 ones | 4. $79 = n$ tens 19 ones |
| 5. 3 tens 4 ones = n tens 14 ones | 6. $29 = n$ tens 19 ones |
| 7. $46 = n + 16$ | 8. $52 = n + 12$ |
| 10. $87 = n + 17$ | 12. $99 = n + 19$ |
| | 9. $17 = n + 17$ |

A ten has been renamed as 10 ones. Find n .

- | | |
|--------------------------------------|----------------------------|
| *13. 5 tens 3 ones = 4 tens n ones | 14. $62 = 5$ tens n ones |
| 15. 7 tens 9 ones = 6 tens n ones | 16. $82 = 7$ tens n ones |
| 17. 4 tens 0 ones = 3 tens n ones | 18. $59 = 4$ tens n ones |
| 19. $33 = 20 + n$ | 21. $68 = 50 + n$ |
| 22. $97 = 80 + n$ | 24. $23 = 10 + n$ |
| 20. $75 = 60 + n$ | 23. $70 = 60 + n$ |

Each number has been renamed. Find n .

- | | |
|--|--------------------------|
| *25. 2 hundreds 5 tens 7 ones = 2 hundreds 4 tens n ones | |
| 26. 7 hundreds 2 tens 0 ones = 7 hundreds n tens 10 ones | |
| 27. $340 = 300 + 30 + n$ | 28. $270 = 200 + n + 10$ |
| 29. $968 = 900 + 50 + n$ | 30. $321 = 300 + n + 11$ |

Rename each number to show 1 less ten and 10 more ones.

- | | | |
|--------------------|-------------------|-------------------|
| *31. 7 tens 2 ones | 32. 3 tens 5 ones | 33. 8 tens 0 ones |
| *34. 86 | 35. 92 | 36. 80 |
| 37. 68 | 38. 70 | |
| 39. 123 | 40. 247 | 41. 761 |
| | | 42. 873 |
| | | 43. 267 |

Keeping Up with the Facts

- | | | | | | |
|--|--|--|--|--|--|
| 1. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ | 2. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$ | 3. $\begin{array}{r} 13 \\ -6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ | 5. $\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$ | 6. $\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$ |
|--|--|--|--|--|--|

SUBTRACTING NUMBERS NAMED BY TWO DIGITS

- A.** Neal has 46 clips. He uses 27.
Can you tell how many he has left?



- Compare the ones.
Is 6 greater than 7?
- Then is $6 - 7$ a whole number?
- You must rename the sum, 46.

$$\begin{array}{r} 46 \\ -27 \\ \hline \end{array}$$

- B.** Here are two ways to show the renaming of the sum.

a.

$$\begin{array}{r} \overset{3}{\cancel{4}} \text{ tens } \overset{16}{\cancel{6}} \text{ ones} \\ -2 \text{ tens } 7 \text{ ones} \\ \hline 1 \text{ ten } 9 \text{ ones, or } 19 \end{array}$$

b.

$$\begin{array}{r} \overset{3}{\cancel{4}} \overset{16}{\cancel{6}} \\ -27 \\ \hline 19 \end{array}$$

- In each way, 1 ten was renamed as ? ones.
Add the 10 ones to the 6 ones to get ? ones.
- Now subtract the ones. $16 - 7 = \underline{\quad}$
Then subtract the tens. $3 \text{ tens} - 2 \text{ tens} = \underline{\quad}$ ten
- What is the answer?

- C.** You can check subtraction
by using addition.

Example Check

$$\begin{array}{r} 46 \\ -27 \\ \hline 19 \end{array} \qquad \begin{array}{r} 19 \\ +27 \\ \hline ?? \end{array}$$

- Is the sum in the check the
same as the sum in the example?

EXERCISES

Rename each as 1 less ten and 10 more ones.

- *1. $\overset{?}{\cancel{8}} \overset{14}{\cancel{4}}$ 2. $\overset{8}{\cancel{9}} \overset{??}{\cancel{3}}$ 3. $\overset{6}{\cancel{7}} \overset{??}{\cancel{4}}$ 4. $\overset{6}{\cancel{7}} \overset{??}{\cancel{0}}$ 5. $\overset{?}{\cancel{6}} \overset{??}{\cancel{5}}$ 6. $\overset{?}{\cancel{5}} \overset{??}{\cancel{7}}$

*1. 7

Copy and complete. Then give the simplest name for the answer.

$$\begin{array}{r} \overset{6}{7} \text{ tens } \overset{14}{4} \text{ ones} \\ - 3 \text{ tens } 8 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} \overset{8}{9} \text{ tens } \overset{??}{0} \text{ ones} \\ - 7 \text{ tens } 9 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

$$\begin{array}{r} \overset{?}{6} \text{ tens } \overset{??}{2} \text{ ones} \\ - 2 \text{ tens } 5 \text{ ones} \\ \hline ? \text{ tens } ? \text{ ones} \end{array}$$

Copy and complete.

$$\begin{array}{r} \overset{3}{4} \overset{16}{0} \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{6} \overset{??}{0} \\ - 32 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{2} \overset{??}{0} \\ - 139 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{?}{4} \overset{10}{0} \\ - 197 \\ \hline \end{array}$$

Copy. Find the answer by any way you wish.

$$\begin{array}{r} 14. \quad 70 \\ - 35 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 75 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 44 \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} 17. \quad 73 \\ - 25 \\ \hline \end{array}$$

$$\begin{array}{r} 18. \quad 68 \\ - 26 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 81 \\ - 49 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \quad 50 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 21. \quad 70 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 22. \quad 72 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 23. \quad 65 \\ - 48 \\ \hline \end{array}$$

$$\begin{array}{r} 24. \quad 52 \\ - 28 \\ \hline \end{array}$$

$$\begin{array}{r} 25. \quad 45 \\ - 28 \\ \hline \end{array}$$

Write an estimate first. Then copy and find the unknown addend.

$$\begin{array}{r} 26. \quad 73 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 27. \quad 85 \\ - 27 \\ \hline \end{array}$$

$$\begin{array}{r} 28. \quad 45 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 29. \quad 53 \\ - 19 \\ \hline \end{array}$$

$$\begin{array}{r} 30. \quad 95 \\ - 27 \\ \hline \end{array}$$

$$\begin{array}{r} 31. \quad 435 \\ - 127 \\ \hline \end{array}$$

$$\begin{array}{r} 32. \quad 774 \\ - 350 \\ \hline \end{array}$$

$$\begin{array}{r} 33. \quad 684 \\ - 349 \\ \hline \end{array}$$

$$\begin{array}{r} 34. \quad 391 \\ - 258 \\ \hline \end{array}$$

$$\begin{array}{r} 35. \quad 495 \\ - 169 \\ \hline \end{array}$$

Use the addition check to find if the answers are correct.

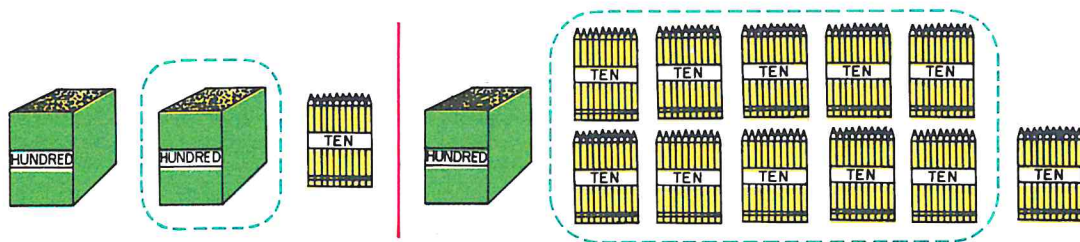
$$\begin{array}{r} 36. \quad 120 \\ - 59 \\ \hline 61 \end{array}$$

$$\begin{array}{r} 37. \quad 133 \\ - 48 \\ \hline 95 \end{array}$$

$$\begin{array}{r} 38. \quad 443 \\ - 27 \\ \hline 406 \end{array}$$

$$\begin{array}{r} 39. \quad 75 \\ - 36 \\ \hline 39 \end{array}$$

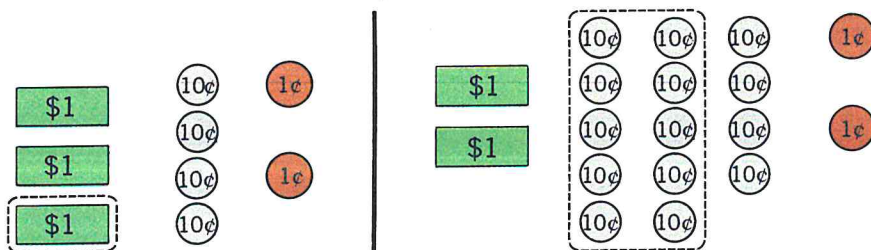
RENAMING A HUNDRED AS TENS



A. Both pictures above show the same number of pencils, 210.

- The picture at the left shows 2 hundreds 1 ten.
- In the picture at the right, 1 box of 100 has been opened.
The picture shows hundred tens.
- 2 hundreds 1 ten = 1 hundred tens.

B. How is the picture at the right below different from the one at the left? How are they alike?



- 3 dollars 4 dimes 2 pennies = 2 dollars dimes 2 pennies.
- $342 = 200 + \underline{\hspace{1cm}} + 2$

C. A coiled rope below has been renamed as 10 heelbones.



- $222 = 100 + \underline{\hspace{1cm}} + 2$

✓ In **A**, **B**, and **C** above, 1 hundred was renamed as tens.
Each number was renamed as less hundred and more tens.

EXERCISES

A hundred has been renamed as 10 tens. Find n .

- * 1. 3 hundreds 2 tens = n hundreds 12 tens
2. 6 hundreds 8 tens = n hundreds 18 tens
3. 2 hundreds 7 tens = 1 hundred n tens
4. 4 hundreds 0 tens = 3 hundreds n tens
5. $430 = 300 + n$ tens
6. $900 = 800 + n$ tens
7. $270 = 100 + n$ tens
8. $400 = 300 + n$ tens
9. $320 = n$ hundreds 12 tens
10. $680 = n$ hundreds 18 tens
11. $700 = n$ hundreds 10 tens
12. $670 = n$ hundreds 17 tens
13. $560 = n$ hundreds 16 tens
14. $n = 7$ hundreds 13 tens
15. $n = 0$ hundreds 15 tens
16. $n = 2$ hundreds 14 tens

Rename each number to show 1 less hundred and 10 more tens.

- * 17. 240
18. 680
19. 910
20. 730
21. 578
22. 465
23. 356
24. 819

Copy and complete each chart to show another name for the number.

25.

	Hundreds	Tens	Ones
600	5	?	0
800	7	?	0
300	?	10	0
200	?	10	0

26.

	Hundreds	Tens	Ones
430	?	13	0
770	?	17	0
860	7	?	0
367	2	?	7

Think Twice

Find 10 sets of 3 numbers that make the sentence below true.

27. $548 = x$ hundreds y tens z ones.

Keeping Up with the Facts

1. $7 - 4 = n$
2. $15 - 6 = n$
3. $14 - 8 = n$
4. $17 - 9 = n$

* 1. 2 17. 1 hundred 14 tens 0 ones

SUBTRACTING NUMBERS NAMED BY THREE DIGITS

A. How does Jody decide if she needs to rename?

$$\begin{array}{r} 435 \\ -104 \\ \hline ?1 \end{array}$$

$$\begin{array}{r} 405 \\ -134 \\ \hline ?1 \end{array}$$



B. Here is the way Jody solves $405 - 134 = n$.

$$\begin{array}{r} 405 \\ -134 \\ \hline 1 \end{array}$$



$$\begin{array}{r} \text{3 10} \\ 405 \\ -134 \\ \hline 71 \end{array}$$



$$\begin{array}{r} \text{3 10} \\ 405 \\ -134 \\ \hline 271 \end{array}$$

Compare the ones.
Subtract.
Compare the tens.

Rename a hundred
as 10 tens.
Subtract.

Subtract
the
hundreds.

■ Use addition to check Jody's answer.

C. How has the sum been renamed? Why was it renamed?

$$\begin{array}{r} \text{5 10} \\ 607 \\ -483 \\ \hline \end{array}$$

$$\begin{array}{r} \text{3 12} \\ 428 \\ -143 \\ \hline \end{array}$$

$$\begin{array}{r} \text{4 10} \\ 506 \\ -392 \\ \hline \end{array}$$

$$\begin{array}{r} \text{8 13} \\ 936 \\ -385 \\ \hline \end{array}$$

D. In which of these examples do you need to rename a hundred as 10 tens?

$$\begin{array}{r} 326 \\ -125 \\ \hline \end{array}$$

$$\begin{array}{r} 326 \\ -135 \\ \hline \end{array}$$

$$\begin{array}{r} 830 \\ -260 \\ \hline \end{array}$$

$$\begin{array}{r} 860 \\ -230 \\ \hline \end{array}$$

$$\begin{array}{r} 326 \\ -180 \\ \hline \end{array}$$

■ When do you need to rename a hundred in subtraction?

EXERCISES

Complete each subtraction.

$$\begin{array}{r} \text{2 14} \\ *1. \quad \cancel{3} \cancel{4} 5 \\ - 192 \\ \hline 15? \end{array}$$

$$\begin{array}{r} \text{7 12} \\ 2. \quad \cancel{8} \cancel{2} 0 \\ - 180 \\ \hline ??0 \end{array}$$

$$\begin{array}{r} \text{? ??} \\ 3. \quad \cancel{7} \cancel{3} 0 \\ - 280 \\ \hline ??0 \end{array}$$

$$\begin{array}{r} \text{? ??} \\ 4. \quad \cancel{6} \cancel{3} 5 \\ - 283 \\ \hline ??? \end{array}$$

Copy. Then subtract. Check by using addition.

$$\begin{array}{r} *5. \quad 607 \\ - 274 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 705 \\ - 252 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 807 \\ - 384 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 896 \\ - 580 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 619 \\ - 377 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 535 \\ - 252 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 957 \\ - 438 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 273 \\ - 134 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 447 \\ - 392 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 589 \\ - 269 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 560 \\ - 326 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 952 \\ - 835 \\ \hline \end{array}$$

Write an estimate first. Then find n .

$$*17. 344 - 182 = n$$

$$18. 436 - 143 = n$$

$$19. 525 - 75 = n$$

$$20. 859 - 36 = n$$

$$21. 863 - 219 = n$$

$$22. 304 - 163 = n$$

$$23. 195 + n = 877$$

$$24. n + 83 = 703$$

$$25. n + 437 = 994$$

$$26. n + 500 = 963$$

$$27. 492 = n + 300$$

$$28. 437 = n + 183$$

29. There are 267 pieces in Julia's giant jigsaw puzzle. She has used 179 pieces. She has n more pieces to use.



Think Twice

Copy and complete.

$$\begin{array}{r} 30. \quad 492 \\ - ??? \\ \hline 210 \end{array}$$

$$\begin{array}{r} 31. \quad 560 \\ - 2?0 \\ \hline ?4? \end{array}$$

$$\begin{array}{r} 32. \quad ?47 \\ - 1?2 \\ \hline 67? \end{array}$$

$$\begin{array}{r} 33. \quad 4?? \\ - ?38 \\ \hline 170 \end{array}$$

$$\begin{array}{r} 34. \quad ?23 \\ - 1?? \\ \hline 691 \end{array}$$

* 1. 153 5. 333 17. 100; 162

FINDING THE AMOUNT OF MONEY

- A.** Julie has \$3.29. She spends \$2.45 for a rain hat.
To find how much money she has left, Julie subtracts.

- Julie thinks: \$3.29 is the same as 329 cents.
\$2.45 is the same as 245 cents.



- Julie remembers to write the dollar sign and cents point in her answer.

- ✓ Copy and find the answer.
Remember to write the dollar sign
and cents point in the answer.

\$2.74	\$5.36
+ 1.25	- 2.83
???	???

EXERCISES

Solve. Remember to write the dollar sign and cents point in your answer.

- | | | | | |
|----------------------|---------------------|--------------------|---------------------|---------------------|
| *1. \$5.74
+ 2.23 | 2. \$9.07
+ 6.43 | 3. \$4.65
+ .74 | 4. \$5.86
+ 5.07 | 5. \$4.83
+ 2.78 |
| *6. \$7.73
- 7.49 | 7. \$8.64
- 7.80 | 8. \$3.88
- .96 | 9. \$8.86
- .58 | 10. \$9.29
- .38 |

11. John has \$4.23. He spends \$1.90. He has ? left.
12. Ed spent \$8.62 and \$1.50. He spent ? in all.

* 1. \$7.97 6. \$.24

KEEPING UP IN MATHEMATICS

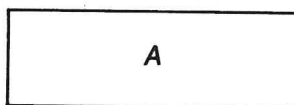


Which object in the picture reminds you of each? [80-86]

1. Point.
2. Line segment.
3. Triangle.
4. Square.
5. Circle.
6. Rectangle.

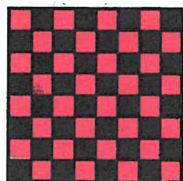
Measure the distance around rectangle A. [88-89]

7. In centimeters.
8. In inches.
9. In half inches.
10. In quarter inches.



What is the measure in square units of this checkerboard? [90-91]

11.



Write a number pair to describe the part that is red. [92-93]

- 12.
- 13.
- 14.
- 15.
- 16.
- 17.

Write a fraction for each. [94-95]

18. (1, 3)
19. (2, 2)
20. (5, 6)
21. (3, 4)
22. (7, 10)
23. (8, 5)

Complete the chart. [17,103]

24.

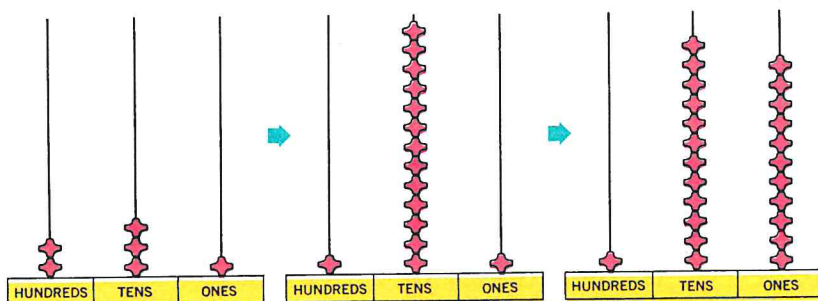
	25¢ is worth	50¢ is worth	100¢ is worth
Dollar			1
Half Dollar		1	?
Quarter	1	?	?
Dime		?	?
Nickel	?	?	?
Penny	?	?	?

Find an approximation for each number to the nearest hundred. [38]

25. 328
26. 890
27. 79
28. 113
29. 445
30. 683

RENAMING TWICE IN SUBTRACTION

A. Mark renamed 231 twice.



- He renamed 1 ten as 10 ones.
 - He renamed 1 hundred as 10 tens.
- 231 = 2 hundred 2 tens ? ones
 = 1 hundred ? tens 11 ones.

B. Chris had to rename twice to subtract 187 from 462.

$$\begin{array}{r}
 \overset{5}{4} \overset{12}{\cancel{6}} \overset{2}{2} \\
 - 187 \\
 \hline
 5
 \end{array}
 \quad \rightarrow \quad
 \begin{array}{r}
 \overset{15}{3} \overset{12}{\cancel{4}} \overset{2}{2} \\
 - 187 \\
 \hline
 75
 \end{array}
 \quad \rightarrow \quad
 \begin{array}{r}
 \overset{15}{3} \overset{12}{\cancel{4}} \overset{2}{2} \\
 - 187 \\
 \hline
 275
 \end{array}$$

Compare the ones.
 Rename.
 Subtract.

Compare the tens.
 Rename.
 Subtract.

Subtract
 the
 hundreds.

- Use addition to check the answer.

C. To solve $500 - 368 = n$, you rename twice.

- 5 hundreds = 4 hundreds 10 tens 0 ones
 = 4 hundreds 9 tens 10 ones
- Complete the subtraction.

$$\begin{array}{r}
 \overset{9}{4} \overset{10}{\cancel{0}} \overset{0}{0} \\
 - 368 \\
 \hline
 ? ? ?
 \end{array}$$

EXERCISES

- *1. $568 = 5 \text{ hundreds } 5 \text{ tens } \underline{\quad} \text{ ones}$
 $= 4 \text{ hundreds } \underline{\quad} \text{ tens } 18 \text{ ones}$
2. $324 = 3 \text{ hundreds } 1 \text{ ten } \underline{\quad} \text{ ones}$
 $= 2 \text{ hundreds } \underline{\quad} \text{ tens } 14 \text{ ones}$
3. $601 = \underline{\quad} \text{ hundreds } 10 \text{ tens } 1 \text{ one}$
 $= 5 \text{ hundreds } \underline{\quad} \text{ tens } 11 \text{ ones}$

Find the missing digits.

4.

$$\begin{array}{r} \overset{4 \text{ ??}}{3 \cancel{5} 2} \\ -198 \\ \hline ? \end{array} \quad \rightarrow \quad \begin{array}{r} \overset{2 \text{ ??}}{\cancel{4} 12} \\ 3 \cancel{5} 2 \\ -198 \\ \hline ? ? ? \end{array}$$

5.

$$\begin{array}{r} \overset{? \text{ 10}}{7 \cancel{0} 5} \\ -188 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} \overset{? \text{ ??}}{6 \cancel{10}} \\ 7 \cancel{0} 5 \\ -188 \\ \hline ? ? ? \end{array}$$

Use the whole number example to find the amount of money.

6.

$$\begin{array}{r} \overset{9 \text{ 10}}{4 \cancel{10}} \\ 5 \cancel{0} 0 \\ -324 \\ \hline \end{array}$$

$$\begin{array}{r} \$5.00 \\ -3.24 \\ \hline \end{array}$$

7.

$$\begin{array}{r} \overset{9 \text{ 10}}{5 \cancel{10}} \\ 6 \cancel{0} 0 \\ -478 \\ \hline \end{array}$$

$$\begin{array}{r} \$6.00 \\ -4.78 \\ \hline \end{array}$$

Solve.

*8. $\begin{array}{r} 842 \\ -357 \\ \hline \end{array}$

9. $\begin{array}{r} 753 \\ -269 \\ \hline \end{array}$

10. $\begin{array}{r} 607 \\ -438 \\ \hline \end{array}$

11. $\begin{array}{r} 817 \\ -59 \\ \hline \end{array}$

12. $\begin{array}{r} 530 \\ -271 \\ \hline \end{array}$

13. $\begin{array}{r} 227 \\ -149 \\ \hline \end{array}$

14. $\begin{array}{r} 413 \\ -335 \\ \hline \end{array}$

15. $\begin{array}{r} 308 \\ -199 \\ \hline \end{array}$

16. $\begin{array}{r} 362 \\ -178 \\ \hline \end{array}$

17. $\begin{array}{r} 240 \\ -173 \\ \hline \end{array}$

18. $\begin{array}{r} \$7.00 \\ -4.86 \\ \hline \end{array}$

19. $\begin{array}{r} \$8.00 \\ -2.63 \\ \hline \end{array}$

20. $\begin{array}{r} \$2.00 \\ -1.75 \\ \hline \end{array}$

21. $\begin{array}{r} \$9.00 \\ -8.97 \\ \hline \end{array}$

22. $\begin{array}{r} \$5.00 \\ -1.44 \\ \hline \end{array}$

Write an estimate first. Then find n and check.

*23. $311 - 293 = n$

24. $357 - 268 = n$

25. $562 - 95 = n$

26. $700 - 345 = n$

27. $198 + n = 306$

28. $483 + n = 812$

* 1. 18; 15 8. 485 23. 0; 18

WRITING SUBTRACTION EXAMPLES CORRECTLY

- A.** Miss Scott had the class find how much more five dollars is than three dollars and forty-six cents.

$$\begin{array}{r} \$5 \\ - 3.46 \\ \hline \end{array}$$

- Why is the first example wrong? \$5.00
 - Is this example written correctly? – 3.46
- Copy it and find the answer.

- B.** How much change will you get from a five-dollar bill if you spend \$2.45? \$.67? \$1.23? \$4.76?



EXERCISES

Find the answer and check.

- | | |
|----------------------------|----------------------------|
| * 1. $\$9.00 - \$1.28 = ?$ | 2. $\$10.00 - \$1.58 = ?$ |
| 3. $\$5.00 - \$1.09 = ?$ | 4. $\$3.00 - \$2.98 = ?$ |
| 5. $\$7.00 - \$0.79 = ?$ | 6. $\$9.80 - \$3.00 = ?$ |
| 7. $\$6.00 - \$0.43 = ?$ | 8. $\$7.00 - \$2.04 = ?$ |
| 9. $\$4.98 - \$2.00 = ?$ | 10. $\$10.00 - \$0.39 = ?$ |

Estimate each answer. Then find each answer.

- | | | | | |
|---|---|--|--|--|
| * 11. $\begin{array}{r} 711 \\ - 348 \\ \hline \end{array}$ | 12. $\begin{array}{r} 546 \\ - 159 \\ \hline \end{array}$ | 13. $\begin{array}{r} 483 \\ - 198 \\ \hline \end{array}$ | 14. $\begin{array}{r} 311 \\ - 274 \\ \hline \end{array}$ | 15. $\begin{array}{r} 576 \\ - 287 \\ \hline \end{array}$ |
| 16. $\begin{array}{r} \$4.67 \\ - 1.73 \\ \hline \end{array}$ | 17. $\begin{array}{r} \$6.35 \\ - 5.45 \\ \hline \end{array}$ | 18. $\begin{array}{r} \$5.45 \\ - .55 \\ \hline \end{array}$ | 19. $\begin{array}{r} \$3.88 \\ - .90 \\ \hline \end{array}$ | 20. $\begin{array}{r} \$9.57 \\ - .58 \\ \hline \end{array}$ |
| * 21. $\begin{array}{r} 700 \\ - 375 \\ \hline \end{array}$ | 22. $\begin{array}{r} 400 \\ - 276 \\ \hline \end{array}$ | 23. $\begin{array}{r} 800 \\ - 483 \\ \hline \end{array}$ | 24. $\begin{array}{r} 500 \\ - 125 \\ \hline \end{array}$ | 25. $\begin{array}{r} 600 \\ - 75 \\ \hline \end{array}$ |

26. Earl's haircut cost \$2.75. He gave the barber \$5.00.
How much change did he get?

* 1. \$7.72 11. 400; 363 21. 300; 325

TRY AN EASIER PROBLEM FIRST

A. Try this problem. If you cannot do it, try the problem in **B**.

- A book costs \$3.47. Laura has two and a half dollars. She needs ? more to buy it.



B. A model costs \$3.00. John has \$2.00. John needs ? more to buy it.

- Do you add or subtract to find the answer?
\$3.00 – \$2.00 = ?
- Go back and do the problem in **A**.



EXERCISES

If you have trouble with the problem in column **A**, do the problem in column **B**. Then go back and try the problem in column **A** again.

A

1. Bob had \$4.65 in the bank. He put in \$1.75 more. Now he has ? in the bank.
2. Mary needs 2 pairs of curtains. Each pair costs \$4.98. They will cost ? .
3. Bobo's Boat Basin has 63 boats. If 28 boats are rented, then ? are left.
4. Ken weighs 93 pounds. Al weighs 87. Ken weighs ? more pounds than Al.

B

1. 24 cookies in a jar. 12 more in a box. ? cookies in all.
2. 2 boxes of popcorn. Each costs 25¢. Both cost ? .
3. 8 slices of pizza. 5 slices eaten. ? slices left.
4. 7 shirts. 3 ties. ? more shirts.

CHECKPOINT

✓ Check your understanding of **key terms and phrases**.

Use each in a sentence.

unknown addend

estimate

subtract

sum

✓ Check your understanding of **key ideas**.

1a. Solve.

$$10 - 6 = 4 \text{ so, } 11 - 6 = n$$

$$14 - 3 = 11 \text{ so, } 20 - 3 = n$$

1b. How does the unknown addend change when the sum increases?

2a. Rename.

4 dimes 2 pennies =

3 dimes pennies

2b. How is renaming in subtraction different from renaming in addition?

3a. Rename 346.

2 hundreds tens 6 ones.

3b. One hundred is how many tens?

4a. Solve.

$$\begin{array}{r} 964 \\ -175 \\ \hline \end{array} \qquad \begin{array}{r} \$9.64 \\ -1.75 \\ \hline \end{array}$$

4b. How is subtracting money like subtracting whole numbers? How is it different?

✓ Check your **skills**.

1. 46	2. 63	3. 35	4. 86	5. 92	6. 71
<u> -37 </u>	<u> -56 </u>	<u> -18 </u>	<u> -49 </u>	<u> -58 </u>	<u> -57 </u>

7. 871	8. 926	9. 618	10. 763	11. 252	12. 730
<u> -580 </u>	<u> -745 </u>	<u> -437 </u>	<u> -578 </u>	<u> -185 </u>	<u> -591 </u>

13. \$6.00	14. \$8.64	15. \$3.52	16. \$5.03	17. \$7.21	18. \$4.26
<u> -3.35 </u>	<u> -5.99 </u>	<u> -1.86 </u>	<u> -2.48 </u>	<u> -4.57 </u>	<u> -2.28 </u>

UNIT TEST

Complete each sentence.

1. 3 dimes 18 pennies is worth the same as 4 dimes ? pennies.
2. $659 = 5$ hundreds ? tens 9 ones.
3. $11 - 7 = 4$, so $21 - 17 = ?$
4. Jean had \$3.00. She spent \$1.49. She has ? left.
5. Replace \bullet with $<$, $=$, or $>$. Since $561 - 161 = 400$, then $561 - 169 \bullet 400$.

Name the missing addends.

6. $\square + 27 = 95$

7. $97 - \triangle = 55$

Find the answers.

8.
$$\begin{array}{r} 43 \\ -27 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 925 \\ -40 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 821 \\ -675 \\ \hline \end{array}$$

If you have time, try these.

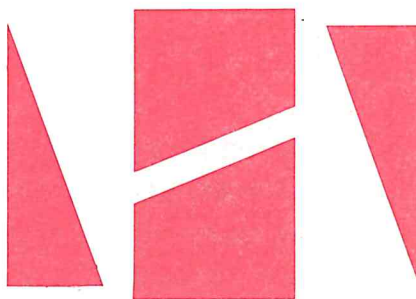
11. $39 + 27 = 66$, so $39 + 28 = ?$

12. $63 - 25 = 38$, so $63 - 26 = ?$

MATHAMUSEMENTS

Trace each figure at the right.

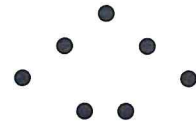
- Then cut out each figure.
See how many shapes and figures you can make.
- Use all four figures
to make a square;
to make a triangle.



INQUIRY INTO GEOMETRY

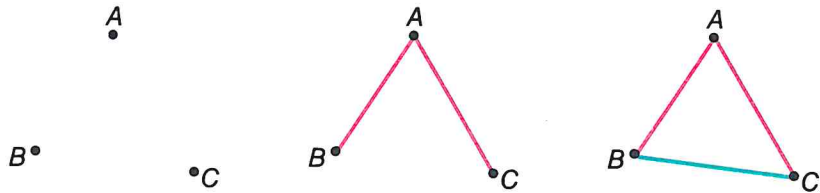
How Many Line Segments?

How many dots are in the set at the right? Can you tell the least number of line segments needed to connect every pair of dots in this set without drawing the line segments?



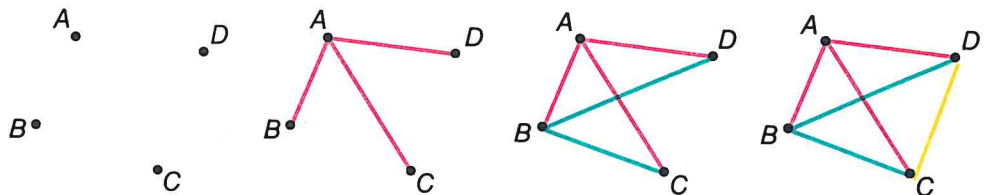
- If you cannot tell, do the following exercises. Look for a pattern that will help you find the answer.

On your paper, mark 3 dots for points. The points must not be on the same line.



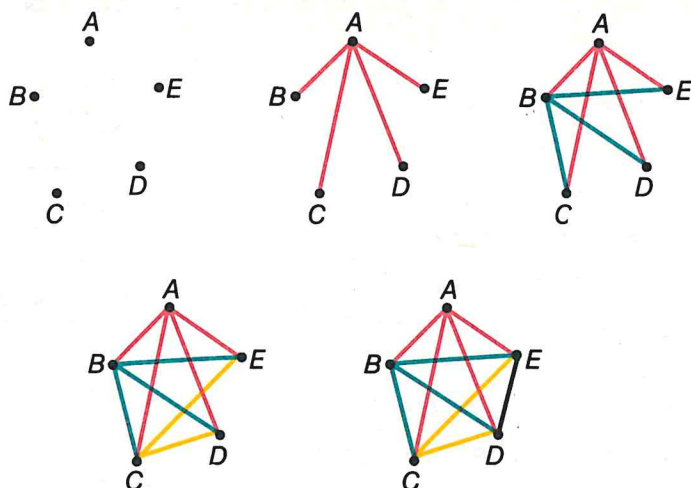
- How many segments begin at A ? Draw them.
- How many other segments begin at B ? Draw it.
- In all, there are $2 + 1$, or ? segments.

Now mark 4 dots for points on your paper.



- How many segments begin at A ? Draw them.
- How many other segments begin at B ? Draw them.
- How many other segments begin at C ? Draw it.
- In all, there are $3 + 2 + 1$, or ? segments.

Mark 5 dots for points on your paper.



- How many segments begin at A ? Draw them.
- How many other segments begin at B ? Draw them.
- How many other segments begin at C ? Draw them.
- How many other segments begin at D ? Draw it.
- In all, there are $4 + 3 + \underline{\quad} + \underline{\quad}$, or $\underline{\quad}$ segments.

Put what you have discovered in a chart. Look for a pattern.

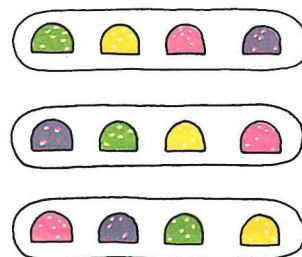
NUMBER OF POINTS	NUMBER OF LINE SEGMENTS
3	$2 + 1$, or $\underline{\quad}$
4	$3 + 2 + 1$, or $\underline{\quad}$
5	$4 + 3 + \underline{\quad} + \underline{\quad}$, or $\underline{\quad}$

- Guess how many segments you would draw to connect 6 points.
- Check your guess by marking 6 dots on your paper and drawing the segments.
- Now use the pattern to answer the question that was asked in the beginning about the 7 dots.

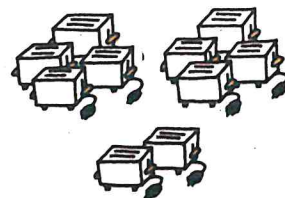
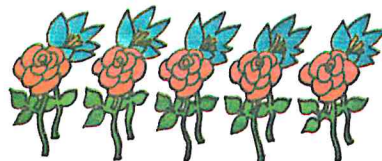
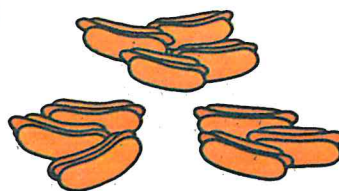
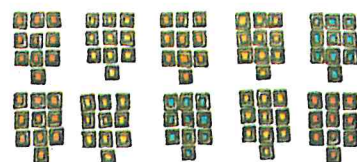
IDENTIFYING EQUIVALENT SETS

A. Think of each row of gumdrops as a set.

- Are the sets equivalent?
- How many sets are there?
How many are in each set?
- Are there 3 sets of 4 gumdrops?



B. Look at the sets in each picture.
Tell whether or not the sets are equivalent.



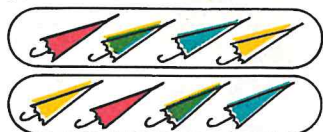
C. For each picture above that shows equivalent sets, answer the following questions.

- How many sets are there? How many in each set?
There are ? sets of ? .

EXERCISES

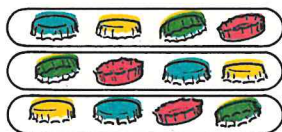
For each picture, tell what number n represents.

*1.



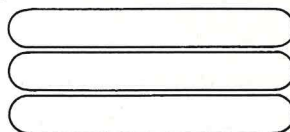
2 sets of n

2.



3 sets of n

3.



n sets of 0

4.



n sets of 5

5.



n sets of 3

6.



2 sets of n

7.



n sets of 3

8.



3 sets of n

9.



4 sets of n

10.



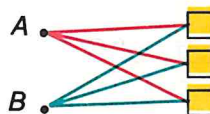
n sets of 4

Find the answer.

11. How many segments from A?

How many segments from B?

There are 2 sets of ? segments.

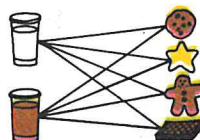


12. There are 2 kinds of milk.

There are 4 kinds of cookies.

There are 2 sets of ?

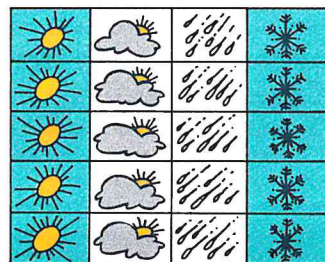
combinations of milk and cookies.



THE MULTIPLICATION SIGN

A. How many weather pictures did Lucy draw in the top row?

- How many sets of 4 are there?
- You can think of 5 sets of 4 as 5 *times* 4.



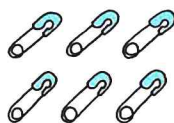
B. Another way to show 5 times 4 is 5×4 .
The symbol \times is the multiplication sign.
You read it as “times.”

- 5×4 is read as “five times four.”
How should you read 4×5 ?
- 5×4 is one way to show how many weather pictures there are altogether.

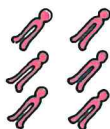
EXERCISES

Use digits and the symbol \times to show how many there are altogether.

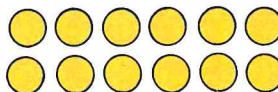
*1.



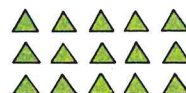
2.



3.



4.



*5. 9 sets of 8

6. 8 sets of 9

7. 7 sets of 10

The first numeral tells how many sets there are. The second numeral tells how many are in each set. Use \times to show how many there are altogether.

*8. {7, 2}

9. {6, 5}

10. {5, 6}

11. {10, 2}

12. {100, 2}

Think Twice

13. Draw a picture for 2×6 . Now draw a picture to show 6×2 .
How do the pictures for 2×6 and 6×2 compare?

*1. 2×3

5. 9×8

8. 7×2

MULTIPLICATION WITH 10 AS A FACTOR

A. Since 4 tens is 4 sets of 10,
one name for 4 tens is 4×10 .

- What is the decimal name for 4 tens?
- So 40 names the same number
as 4×10 .

$$4 \text{ tens} = 4 \times 10$$

$$4 \text{ tens} = 40$$

so

$$4 \times 10 = 40$$

B. In $4 \times 10 = 40$,
4 and 10 are the **factors**;
40 is the **product**.

factor \times factor = product

$$4 \times 10 = 40$$

C. Read each sentence and give the simplest name for the product.

■ $3 \times 10 = n$

■ $5 \times 10 = n$

■ $7 \times 10 = n$

EXERCISES

Complete.

*1. 6 tens = 6×10

$$6 \text{ tens} = 60,$$

$$\text{so } 6 \times 10 = \underline{\quad ? \quad}$$

2. 8 tens = 8×10

$$8 \text{ tens} = \underline{\quad ? \quad},$$

$$\text{so } 8 \times 10 = \underline{\quad ? \quad}$$

3. 9 tens = $\underline{\quad ? \quad} \times 10$

$$9 \text{ tens} = \underline{\quad ? \quad},$$

$$\text{so } 9 \times 10 = \underline{\quad ? \quad}$$

*4. $2 \times 10 = \underline{\quad ? \quad}$

5. $7 \times 10 = \underline{\quad ? \quad}$

6. $9 \times 10 = \underline{\quad ? \quad}$

7. $1 \times 10 = \underline{\quad ? \quad}$

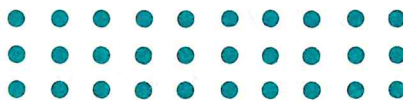
8. $0 \times 10 = \underline{\quad ? \quad}$

9. $10 \times 10 = \underline{\quad ? \quad}$

Copy the picture. Turn your paper
until the red line is at the bottom.

10. Did you change the number of
dots by turning the paper?

11. $3 \times 10 = 30$, so $10 \times 3 = \underline{\quad ? \quad}$



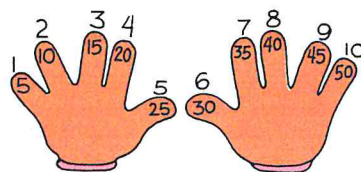
Solve.

*12. $8 \times 10 = 80$, so $10 \times 8 = n$

13. $5 \times 10 = 50$, so $10 \times 5 = n$

MULTIPLICATION WITH 5 AS A FACTOR

Lee drew this picture.
He grouped the fingers in
pairs and numbered them.
Then he counted by fives.



5, 10, 15, 20, 25, 30, 35, 40, 45, 50

A. Use Lee's drawing to give the decimal name for n .

■ $2 \times 5 = n$ $4 \times 5 = n$ $6 \times 5 = n$ $8 \times 5 = n$ $10 \times 5 = n$

Is each first factor an even number? What is true about n ?

■ $1 \times 5 = n$ $3 \times 5 = n$ $5 \times 5 = n$ $7 \times 5 = n$ $9 \times 5 = n$

Is each first factor an odd number? What is true about n ?

B. Read each multiplication sentence.

Multiplication facts with 5 as a factor

$1 \times 5 = 5$	$2 \times 5 = 10$	$3 \times 5 = 15$	$4 \times 5 = 20$	$5 \times 5 = 25$
$6 \times 5 = 30$	$7 \times 5 = 35$	$8 \times 5 = 40$	$9 \times 5 = 45$	$10 \times 5 = 50$
$5 \times 1 = 5$	$5 \times 2 = 10$	$5 \times 3 = 15$	$5 \times 4 = 20$	$5 \times 5 = 25$
$5 \times 6 = 30$	$5 \times 7 = 35$	$5 \times 8 = 40$	$5 \times 9 = 45$	$5 \times 10 = 50$

■ Cover the decimal name for the product. Then try to say it.

EXERCISES

Give the decimal name for n .

*1. 2 fives = 10, so 4 fives = n

3. 7 fives = 35, so 8 fives = n

5. 3 fives = 15, so 4 fives = n

7. 2 fives = 10, so 3 fives = n

2. 5 fives = 25, so 6 fives = n

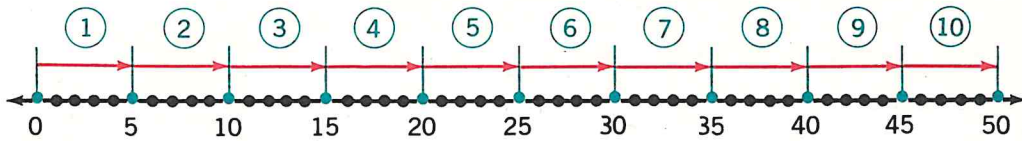
4. 10 fives = 50, so 9 fives = n

6. 6 fives = 30, so 8 fives = n

8. 5 fives = 25, so 7 fives = n

* 1. 20

Find the answer. Use the number line if you need help.

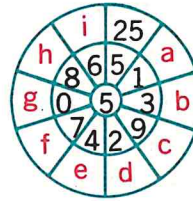


*9. $5 + 5 + 5 + 5 = n$; $4 \times 5 = n$

10. $5 + 5 + 5 + 5 + 5 = n$; $5 \times 5 = n$

11. $5 + 5 + 5 + 5 + 5 + 5 + 5 = n$; $7 \times 5 = n$

12. The two inside rings show factors.
The outside ring shows the product.
What numeral does each letter stand for?

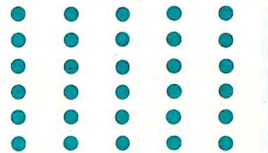


This picture shows 6 fives. Copy it. Turn your paper so that the red line is at the bottom.

13. How many sets of six can you count?

14. 6 fives = 30, so 5 sixes = ?

15. $6 \times 5 = ?$, so $5 \times 6 = ?$



Make a dot picture to show 7×5 .

16. What can you do to the picture to show 5×7 ?

17. What is the product of 7×5 ? of 5×7 ?

Solve.

*18. 2 fives = n , so 5 twos = n

20. 6 fives = n , so 5 sixes = n

22. $1 \times 5 = n$, so $5 \times 1 = n$

24. $0 \times 5 = n$, so $5 \times 0 = n$

19. 4 fives = n , so 5 fours = n

21. 8 fives = n , so 5 eights = n

23. $3 \times 5 = n$, so $5 \times 3 = n$

25. $9 \times 5 = n$, so $5 \times 9 = n$

Write two multiplication sentences for each number family.

*26. {7, 5, 35}

27. {6, 5, 30}

28. {9, 5, 45}

ANOTHER WAY TO SHOW MULTIPLICATION

A. You can show $3 \times 5 = 15$
in *vertical form*.

$$\begin{array}{r} 5 \leftarrow \text{factor} \\ \times 3 \leftarrow \text{factor} \\ \hline 15 \leftarrow \text{product} \end{array}$$

- You can read the example as
"Three times five equals fifteen."
- Where are the factors shown?
- Where is the multiplication sign shown?
- Where is the product shown?

✓ Name the factors in the multiplication
example at the right.
Copy and complete the example.

$$\begin{array}{r} 10 \\ \times 4 \\ \hline ?? \end{array}$$

EXERCISES

Write each example in vertical form. Then give the product.

1. $5 \times 2 = n$ 2. $5 \times 4 = n$ 3. $5 \times 6 = n$ 4. $5 \times 8 = n$
5. $5 \times 10 = n$ 6. $10 \times 1 = n$ 7. $10 \times 3 = n$ 8. $10 \times 5 = n$

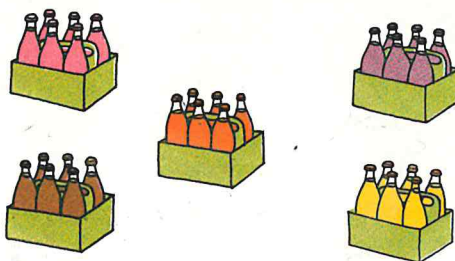
Write the product.

9. $\begin{array}{r} 7 \\ \times 10 \\ \hline \end{array}$ 10. $\begin{array}{r} 9 \\ \times 10 \\ \hline \end{array}$ 11. $\begin{array}{r} 5 \\ \times 1 \\ \hline \end{array}$ 12. $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$ 13. $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$ 14. $\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$
15. $\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$ 16. $\begin{array}{r} 10 \\ \times 2 \\ \hline \end{array}$ 17. $\begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$ 18. $\begin{array}{r} 10 \\ \times 6 \\ \hline \end{array}$ 19. $\begin{array}{r} 10 \\ \times 8 \\ \hline \end{array}$ 20. $\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$
21. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$ 22. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$ 23. $\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$ 24. $\begin{array}{r} 0 \\ \times 5 \\ \hline \end{array}$ 25. $\begin{array}{r} 10 \\ \times 10 \\ \hline \end{array}$ 26. $\begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$
27. $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$ 28. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$ 29. $\begin{array}{r} 10 \\ \times 6 \\ \hline \end{array}$ 30. $\begin{array}{r} 10 \\ \times 9 \\ \hline \end{array}$ 31. $\begin{array}{r} 10 \\ \times 1 \\ \hline \end{array}$ 32. $\begin{array}{r} 10 \\ \times 0 \\ \hline \end{array}$

USING MULTIPLICATION TO SOLVE PROBLEMS

- A.** Jane bought 5 packs of soda.
There are 6 bottles in each pack.
How many bottles did she buy?

- Think: 5 packs of soda
is 5 sets of 6.
- Solve: $5 \times 6 = n$



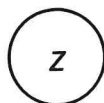
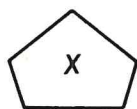
- B.** Find the cost of 8 candy apples at 5 cents each.

- Think: 8 fives = 8×5
- Solve: $8 \times 5 = n$

EXERCISES

Write and solve a number sentence for each problem.

1. Vicki's crayon box has 4 rows. There are 5 crayons in each row. How many crayons are there?
2. Mark helped unload books. He carried 5 books each trip. How many did he carry in 3 trips? in 7 trips? in 8? 10?
3. Joe bought 9 five-cent pencils. Gene bought 5 nine-cent pencils. How much money did each boy spend?

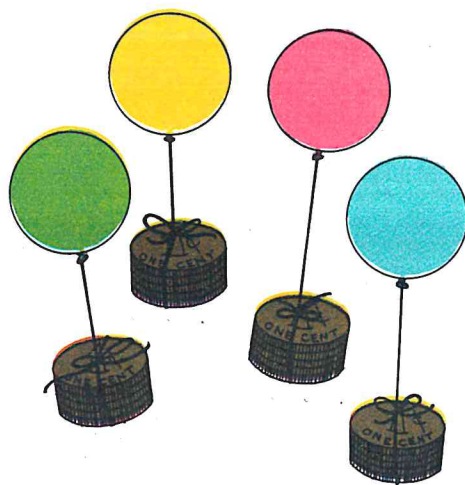


4. How many line segments make up figure X? How many would make up 6 figures like X? make up 8 figures? make up 9?
5. How many corners are there in figure Y? How many would there be in 7 figures like Y? in 9 figures? in 10?
6. How many corners are there in figure Z? How many would there be in 3 figures like Z? in 5 figures? in 7?

FINDING A FACTOR

- A.** Terry wants to know how many balloons she can buy. She has 20¢. The balloons cost 5¢ each.

- Terry grouped 5 pennies in each stack.
- She put a balloon with each stack.
- How many sets of 5 pennies did she have?
- How many balloons can Terry buy?



- B.** Sue used a number line to find the number of 5's in 20.



Sue thought:



0 fives is 0, 1
five is 5, 2 fives is
10, 3 fives is 15,
4 fives is 20.

- So there are 4 fives in 20.
- $\underline{\quad} \times 5 = 20$

- C.** When you find the number n stands for in $n \times 5 = 40$, you have found the *unknown factor*.

- Find the unknown factor in each sentence below.
- n fives make 10, so $n \times 5 = 10$.
- n fives make 15, so $n \times 5 = 15$.
- There are n fives in 30, so $n \times 5 = 30$.
- There are n fives in 40, so $n \times 5 = 40$.

EXERCISES

Find n . If you need help, use the number line in B.

- *1. n fives = 15,
so $n \times 5 = 15$
2. n fives = 25,
so $n \times 5 = 25$
3. n fives = 40,
so $n \times 5 = 40$
4. n five = 5,
so $n \times 5 = 5$
5. n fives = 0,
so $n \times 5 = 0$
6. n fives = 50,
so $n \times 5 = 50$

Use the number line to find n .



- *7. n tens = 20,
so $n \times 10 = 20$
8. n tens = 50,
so $n \times 10 = 50$
9. n tens = 80,
so $n \times 10 = 80$
10. n tens = 30,
so $n \times 10 = 30$
11. n tens = 70,
so $n \times 10 = 70$
12. n tens = 100,
so $n \times 10 = 100$
13. n tens = 60,
so $n \times 10 = 60$
14. n ten = 10,
so $n \times 10 = 10$
15. n tens = 0,
so $n \times 10 = 0$

The first two numbers in each set are factors. The third number is the product of the factors. Find n .

- *16. $\{n, 5, 20\}$
17. $\{n, 10, 50\}$
18. $\{n, 5, 35\}$
19. $\{n, 10, 70\}$
20. $\{n, 5, 15\}$
21. $\{n, 5, 40\}$

Copy and complete each table.

22. Factor	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>
Factor	10	5	10	5	10	5	10	5	10	5
Product	10	10	30	30	40	40	50	50	80	80

Think Twice

23. $n \times 5$	0	5	15	25	35	45
n	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>	<u>?</u>

*1. 3; 3 7. 2; 2 16. 4

DIVISION

A. What number for n makes each sentence true?

$$4 \times 5 = n$$

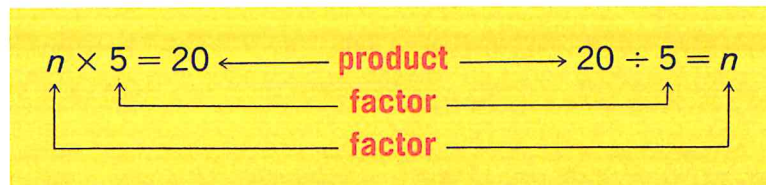
$$n \times 5 = 20$$

- In which sentence did you find a product?
- In which sentence did you find a factor?

When you know two factors and find their product, you have multiplied. When you know a product and one factor and find the other factor, you have divided.

B. The sentence $n \times 5 = 20$ can be written as $20 \div 5 = n$.

- The symbol \div is the division sign. You read it as “divided by.”
- $20 \div 5 = n$ is read as “Twenty divided by five equals n .”
- How should you read $5 \div 5 = 1$? $20 \div 10 = 2$?



C. Try to solve this sentence. $20 \div 5 = n$

You can think:

- How many 5's make 20? 4 fives = 20, so $20 \div 5 = 4$.
- 3 fives = 15, so $15 \div 5 = \underline{\quad}$
- 2 tens = 20, so $20 \div 10 = \underline{\quad}$
- $3 \times 10 = 30$, so $30 \div 10 = \underline{\quad}$
- $5 \times 5 = 25$, so $25 \div 5 = \underline{\quad}$

D. Cover the numeral after the equals sign. Then try to say it.

$$\begin{array}{lllll} 5 \div 5 = 1 & 10 \div 5 = 2 & 15 \div 5 = 3 & 20 \div 5 = 4 & 25 \div 5 = 5 \\ 30 \div 5 = 6 & 35 \div 5 = 7 & 40 \div 5 = 8 & 45 \div 5 = 9 & 50 \div 5 = 10 \end{array}$$

$$\begin{array}{lllll} 10 \div 10 = 1 & 20 \div 10 = 2 & 30 \div 10 = 3 & 40 \div 10 = 4 & 50 \div 10 = 5 \\ 60 \div 10 = 6 & 70 \div 10 = 7 & 80 \div 10 = 8 & 90 \div 10 = 9 & 100 \div 10 = 10 \end{array}$$

EXERCISES

Is n a *Product* or a *Factor*? Find n .

*1. $n \times 5 = 20$

2. $35 \div 5 = n$

3. $80 \div n = 10$

4. $5 \times n = 40$

5. $45 \div n = 5$

6. $5 \times 5 = n$

Solve.

*7. $n \times 5 = 10$, so $10 \div 5 = n$

8. $n \times 5 = 30$, so $30 \div 5 = n$

9. $n \times 5 = 50$, so $50 \div 5 = n$

10. $n \times 10 = 40$, so $40 \div 10 = n$

11. $15 \div 5 = n$

12. $5 \div 5 = n$

13. $100 \div 10 = n$

14. $45 \div 5 = n$

15. $35 \div 5 = n$

16. $20 \div 5 = n$

17. $50 \div 10 = n$

18. $70 \div 10 = n$

19. $80 \div 10 = n$

- *20. Jim has 15 candies in this box.

How many days will they last
if he eats 5 a day? 3 a day?

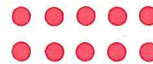


Complete each sentence.

21. Here are ? dots.

There are ? 5's in 10. $10 \div 5 = \underline{\quad ? \quad}$

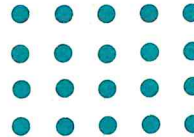
There are ? 2's in 10. $10 \div 2 = \underline{\quad ? \quad}$



22. Here are ? dots.

There are ? 5's in 20. $20 \div 5 = \underline{\quad ? \quad}$

There are ? 4's in 20. $20 \div 4 = \underline{\quad ? \quad}$



Draw sets of dots to show these pairs of facts.

23. $30 \div 5 = 6$ and $30 \div 6 = 5$

24. $40 \div 5 = 8$ and $40 \div 8 = 5$

Answer each question.

25. How many 5's equal 5? $5 \div 5 = \underline{\quad ? \quad}$

26. How many 7's equal 7? $7 \div 7 = \underline{\quad ? \quad}$

Think Twice

Complete the sentence.

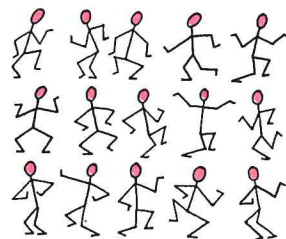
27. When n is a counting number, $n \div n$ is always ? .

* 1. Factor; 4 7. 2; 2 20. 3; 5

MULTIPLICATION-DIVISION FAMILIES

- A.** The picture can help you to see the number family {3, 5, 15}.
How can you look at the picture to see these sentences?

$3 \times 5 = 15$ $15 \div 5 = 3$
 $5 \times 3 = 15$ $15 \div 3 = 5$



- B.** Complete each sentence. Use the hats.

\blacksquare Four fives is ? . \blacksquare Twenty is ? fives.
 Five fours is ? . Twenty is ? fours.



- ✓ Write two multiplication and two division sentences for the number family {4, 5, 20}.

EXERCISES

Copy and complete.

*1. $6 \times 5 = 30$

$5 \times 6 = \underline{\quad ? \quad}$

$30 \div 6 = \underline{\quad ? \quad}$

$30 \div 5 = \underline{\quad ? \quad}$

2. $35 \div 5 = 7$

$35 \div 7 = \underline{\quad ? \quad}$

$5 \times 7 = \underline{\quad ? \quad}$

$7 \times 5 = \underline{\quad ? \quad}$

3. $7 \times 10 = 70$

$10 \times 7 = \underline{\quad ? \quad}$

$70 \div 7 = \underline{\quad ? \quad}$

$70 \div 10 = \underline{\quad ? \quad}$

4. $7 \times 16 = 112$

$112 \div 7 = \underline{\quad ? \quad}$

$112 \div 16 = \underline{\quad ? \quad}$

5. $24 \times 5 = 120$

$120 \div 24 = \underline{\quad ? \quad}$

$120 \div 5 = \underline{\quad ? \quad}$

6. $35 \times 12 = 420$

$420 \div 35 = \underline{\quad ? \quad}$

$420 \div 12 = \underline{\quad ? \quad}$

Write the number family that has the answer to each question.

- *7. Pencils are 7¢ each. How many for 35¢?

8. One eraser costs 5¢. How much are 9?

9. How much are five 10¢ ice cream cones?

10. At 10¢ each, how much are 8 balloons?

* 1. $6 \times 5 = 30$; $5 \times 6 = 30$; $30 \div 6 = 5$; $30 \div 5 = 6$

7. {7, 5, 35}

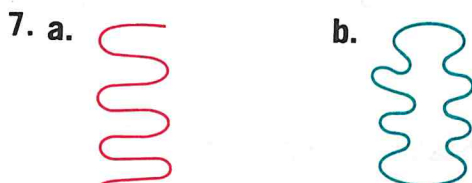
KEEPING UP IN MATHEMATICS

Find the answers. [32-33]

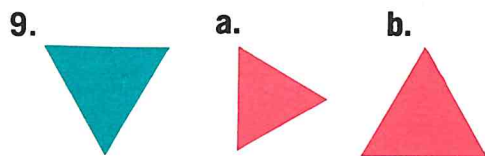
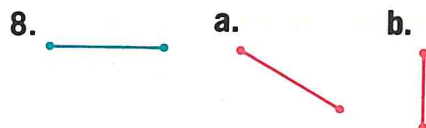
$$\begin{array}{r} 1. \quad 7 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 2. \quad 70 \\ +60 \\ \hline \end{array} \quad \begin{array}{r} 3. \quad 700 \\ +600 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 8 \\ -5 \\ \hline \end{array} \quad \begin{array}{r} 5. \quad 80 \\ -50 \\ \hline \end{array} \quad \begin{array}{r} 6. \quad 800 \\ -500 \\ \hline \end{array}$$

Which of the following is a simple closed path? [82-83]



Which red figure is congruent to the blue figure? [84-85]



Replace \bullet with $<$, $=$ or $>$.
[4]

$$\begin{array}{ll} 10. \quad 8 \bullet 4 & 11. \quad 0 \bullet 3 \\ 12. \quad 2 + 3 \bullet 5 & 13. \quad 9 \bullet 6 + 1 \\ 14. \quad 7 - 2 \bullet 8 & 15. \quad 6 \bullet 9 - 3 \\ 16. \quad 15 - 6 \bullet 6 & 17. \quad 8 - 8 \bullet 7 \end{array}$$

Rename to show 1 less ten and 10 more ones. [114-15]

$$18. \quad 40 \quad 19. \quad 39 \quad 20. \quad 82$$

Rename to show 1 less hundred and 10 more tens. [118-19]

$$21. \quad 720 \quad 22. \quad 960 \quad 23. \quad 510$$

Find the answers. [116, 120, 124]

$$\begin{array}{r} 24. \quad 72 \\ -64 \\ \hline \end{array} \quad \begin{array}{r} 25. \quad 83 \\ -47 \\ \hline \end{array} \quad \begin{array}{r} 26. \quad 91 \\ -85 \\ \hline \end{array}$$

$$\begin{array}{r} 27. \quad 706 \\ -384 \\ \hline \end{array} \quad \begin{array}{r} 28. \quad 839 \\ -542 \\ \hline \end{array} \quad \begin{array}{r} 29. \quad 567 \\ -291 \\ \hline \end{array}$$

$$\begin{array}{r} 30. \quad 962 \\ -763 \\ \hline \end{array} \quad \begin{array}{r} 31. \quad 500 \\ -471 \\ \hline \end{array} \quad \begin{array}{r} 32. \quad 854 \\ -189 \\ \hline \end{array}$$

How much change? [122]

33. Al bought a model for \$3.98. He gave the clerk a five-dollar bill.

34. Gladys bought a dress for \$6.59. She gave the clerk a ten-dollar bill.

35. Mrs. Clark's groceries cost \$7.42. She gave the clerk 8 dollars.

ANOTHER WAY TO SHOW DIVISION

A. You can show $15 \div 5 = 3$ this way.

- Where is the product shown?
- Where are the factors shown?

$$\begin{array}{r} 3 \\ 5 \overline{)15} \end{array}$$

B. Both ways shown at the right ask:
“How many 5’s in 40?”

$$40 \div 5 = \underline{\quad}$$

- Do you know two factors or the product and one factor?

$$\begin{array}{r} ? \\ 5 \overline{)40} \end{array}$$

C. Read the division facts below. Begin: “Five equals how many fives? One. Ten equals how many fives? Two.”

Division facts with 5 as a factor

1	2	3	4	5	6	7	8	9
$5 \overline{)5}$	$5 \overline{)10}$	$5 \overline{)15}$	$5 \overline{)20}$	$5 \overline{)25}$	$5 \overline{)30}$	$5 \overline{)35}$	$5 \overline{)40}$	$5 \overline{)45}$
5	5	5	5	5	5	5	5	5
$1 \overline{)5}$	$2 \overline{)10}$	$3 \overline{)15}$	$4 \overline{)20}$	$5 \overline{)25}$	$6 \overline{)30}$	$7 \overline{)35}$	$8 \overline{)40}$	$9 \overline{)45}$

- Now read the division facts another way. Begin: “Five divided by five equals one. Ten divided by five equals two.”

EXERCISES

Write each division as in **A**. Then find the unknown factor.

1. $40 \div 5 = n$ 2. $5 \div 5 = n$ 3. $35 \div 5 = n$ 4. $15 \div 3 = n$

Write the answer.

5. $5 \overline{)20}$ 6. $6 \overline{)30}$ 7. $5 \overline{)15}$ 8. $5 \overline{)45}$ 9. $5 \overline{)10}$ 10. $9 \overline{)45}$
 11. $4 \overline{)20}$ 12. $7 \overline{)35}$ 13. $6 \overline{)30}$ 14. $8 \overline{)40}$ 15. $10 \overline{)50}$ 16. $2 \overline{)10}$

Write two division facts for each number family.

Example: {3, 2, 6} Answer: $3 \overline{)6}^2$ $2 \overline{)6}^3$

17. {5, 8, 40}

18. {10, 8, 80}

19. {9, 10, 90}

20. {7, 5, 35}

21. {3, 10, 30}

22. {6, 5, 30}

What is the factor n in each number family?

*23. { n , 5, 50}

24. {10, n , 70}

25. {5, n , 45}

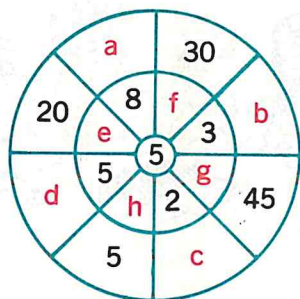
26. {4, n , 20}

27. { n , 10, 60}

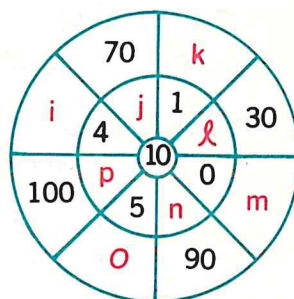
28. { n , 2, 10}

The two inside rings show factors. The outside ring shows the product. What numeral does each letter stand for?

29.



30.



Write and solve a division sentence for each.

31. Five doughnuts come in a package. You want 30 doughnuts.

How many packages do you buy?

32. A loaf of bread has 20 slices. A sandwich takes 2 slices.

How many sandwiches can you make from 1 loaf?

Think Twice

Copy and complete the chart.

33.	n	?	?	?	?	?	?	?	?
	$n \times 5$	0	5	10	20	25	30	35	45

* 23. 10

USING DIVISION TO SOLVE PROBLEMS

- A.** Miss Gale has 30 bottles of soda.
She puts 6 bottles in a pack.
How many packs does she need?

- Think: How many sets of 6 are there in 30?
 n sets of 6 make 30.
 $n \times 6 = 30$

- Solve: $n \times 6 = 30$, so $30 \div 6 = n$



- B.** How can 5 children share
15 cookies equally?

- Think: How many cookies are there in each set?
5 sets of n make 15.
 $5 \times n = 15$

- Solve: $5 \times n = 15$, so $15 \div 5 = n$



- C.** Complete each table.

- Candy bars cost 10¢ each.

You have	10¢	20¢	30¢	40¢	50¢	60¢	70¢	80¢	90¢	100¢
You can buy	1	2	?	?	?	?	?	?	?	?

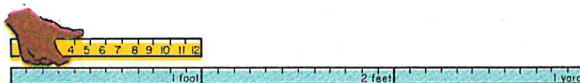
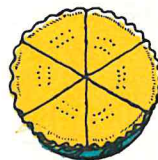
- Carol can make one paper flower in 5 minutes.

Minutes spent	5	10	15	20	25	30	35	40	45	50
Flowers made	1	2	?	?	?	?	?	?	?	?

EXERCISES

Write and solve a number sentence for each problem.

1. Nancy wants to exchange her pennies for dimes. She has 90 pennies.
How many dimes will she get?
2. Jane wrote 10 addition facts in 10 minutes.
How long did it take her to write each fact?
3. How many 5¢ toys can you buy for 20¢? for 15¢? for 40¢?
4. Pies are cut into 6 pieces of equal size.
How many pies are needed to serve a piece of pie to each of 30 people?
5. Tom needs 40 little bells for a clown costume. There are 5 bells on a card. How many cards should he buy?
6. Can 6 girls share 60¢ equally? How much money does each girl get?
7. Rose needs 30 hot dogs for her party.
There are 10 hot dogs in a package.
How many packages should she buy?
8. Marge has 35 seeds to plant. She wants to plant the same number of seeds in each of 5 boxes. How many seeds will she put in each box?
9. There are 20 boys in a gym class. They are making teams of 5 boys each. How many teams will there be?
10. How many yards are as long as 30 feet?



CHECKPOINT

- ✓ Check your understanding of **key terms, phrases, and symbols**.
Use each in a sentence.

equivalent sets
nonequivalent sets
vertical form
unknown factor

factor
product
times, \times
divided by, \div

- ✓ Check your understanding of **key ideas**.

1a. Do you multiply or divide to find each answer?

$$5 \times 5 = n$$

$$n = 5 \times 5$$

$$n \times 7 = 35$$

$$7 \times n = 35$$

1b. Complete each sentence with the word *multiply* or *divide*.

You know two factors; to find their product, you ?.

You know a product and one factor; to find the other factor, you ?.

- ✓ Check your **skills**.

$$\begin{array}{r} 1. \quad 5 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 9 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 10 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 0 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 10 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 8 \\ \times 5 \\ \hline \end{array}$$

Solve.

$$7. \quad 3 \times 5 = n$$

$$8. \quad 7 \times 5 = n$$

$$9. \quad 2 \times 5 = n$$

$$10. \quad 10 \times n = 40$$

$$11. \quad 5 \times n = 45$$

$$12. \quad n \times 6 = 30$$

$$13. \quad 7 \times n = 70$$

$$14. \quad 5 \times n = 15$$

$$15. \quad n \times 2 = 10$$

$$16. \quad 80 \div 10 = n$$

$$17. \quad 30 \div 10 = n$$

$$18. \quad 40 \div 5 = n$$

$$19. \quad 25 \div 5 = n$$

$$20. \quad 60 \div 10 = n$$

$$21. \quad 10 \div 10 = n$$

$$22. \quad 5 \overline{) 150}$$

$$23. \quad 9 \overline{) 45}$$

$$24. \quad 7 \overline{) 35}$$

UNIT TEST

Complete each sentence.

1. $7 \times 10 = 70$, so $10 \times 7 = \underline{\quad ? \quad}$
2. $12 \times 5 = 60$, so $60 \div 12 = \underline{\quad ? \quad}$
3. There are 7 fives in 35, so $\underline{\quad ? \quad} \times 5 = 35$.
4. $5 \div 5 = \underline{\quad ? \quad}$
5. $10 \div \underline{\quad ? \quad} = 10$

Find the answers.

6. Write two multiplication sentences and two division sentences for this number family? $\{9, 5, 45\}$
7. What is the cost of 3 five-cent balloons?
8. Which of these could 10 boys share equally?
a. 27 cents b. 40 acorns c. 19 cookies d. 35 books
9. Amy bought 4 pencils that cost 5¢ each.
How much did she pay for the 4 pencils?
10. Josh had 25 apples. He put them in 5 bags with the same number in each bag. How many apples were in each bag?

If you have time, try these.

11. What number makes this sentence true? $\triangle \times 8 = 8 \times 5$
12. Name three pairs of numbers that make this sentence true.
 $\square \times \triangle = 30$

MATHAMUSEMENTS

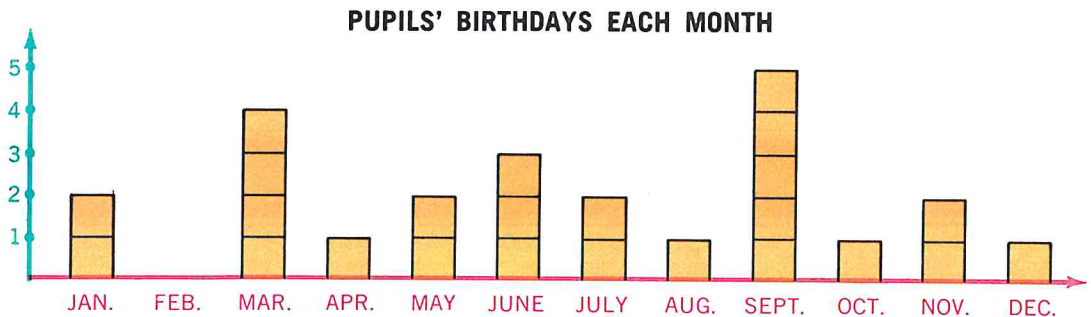
These examples are written in a secret code. Each letter stands for some digit. See if you can decode each example.

$$\begin{array}{r} ABC \\ - 204 \\ \hline 463 \end{array}$$

$$\begin{array}{r} W28 \\ - 17X \\ \hline 4Y1 \end{array}$$

INQUIRY INTO STATISTICS

Organizing and Presenting Data



READING A GRAPH

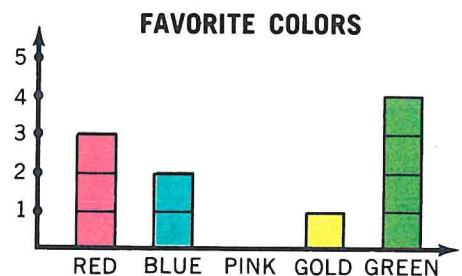
- What does the graph show?
- What does the blue line show? the red line?
- What does each block stand for?
- Which month has the fewest birthdays? the most birthdays?
Which months have the same number of birthdays?

Imagine a line going across the top of the blocks at the numeral 2.

- How many blocks are above the line? below the line?
- Do you have enough blocks above the line to make each of the bars below the line come up to 2?

LOOK AT THE GRAPH

- Where would you draw a line so that the number of blocks above the line is the same as the number of blocks below the line?



MAKING A GRAPH

Ben made a list of pets. Then he found how many of his classmates had each kind of pet. Below are the list and table he made. Use the table to complete the graph.

Bird—Lil, Tina, Ed, Joe

Cat—Carol, Ann, Terry,
Bob, Mike, Juan

Dog—Ken, Ben, Rose, Phil,
Sue, Peg, Judy, Fred

Fish—Rich, Wendy, Linda

Gerbil—Paul, Alan

Snake—

Turtle—Sam

PETS	NUMBER OF PUPILS	
	WHO HAVE THIS PET	
Bird	////	4
Cat	### /	6
Dog	### ///	8
Fish	///	3
Gerbil	//	2
Snake		0
Turtle	/	1



■ Copy and complete the bar graph.

For Further Inquiry

- Make a graph of your classmates' birthdays.
- Make a graph of your classmates' pets.

THE GREATEST NUMBER OF TENS

Miss Adams asks Jean to find other names for 32. Jean uses 32 sticks to help her.

- A.** How many bundles of ten does Jean have? How many ones?

■ $32 = \underline{\quad} \text{ tens} + \underline{\quad} \text{ ones}$

- B.** Jean knows that another name for 3 tens is 3×10 .
How did Jean use this to write the two sentences below?

■ $32 = 3 \text{ tens} + 2 \text{ ones}$
 $32 = (3 \times 10) + 2$

- ✓ Name each number in two ways as Jean did.

47 58 63 70 99 12 8

- C.** Jean wrote more number sentences about 32. Read each.

a. $32 = (3 \times 10) + 2$

b. $32 = (2 \times 10) + 12$

c. $32 = (1 \times 10) + 22$

d. $32 = (0 \times 10) + 32$

- Which sentence helps you see that the greatest number of tens in 32 is 3?
How many ones are left over?

- ✓ Tell the greatest number of tens in each number.
Then tell the number of ones left over.

47 58 63 70 99 12 8



EXERCISES

Suppose q is the greatest number of tens and r is the number of ones left over. Find q , or r , or both.

- *1. In 64, there are q tens and r left over.
2. In 45, there are q tens and r left over.
3. In 70, there are q tens and r left over.
4. In 6, there are q tens and r left over.
- *5. $34 = (q \times 10) + 4$
6. $63 = (q \times 10) + 3$
7. $84 = (q \times 10) + 4$
8. $70 = (q \times 10) + 0$
9. $95 = (q \times 10) + 5$
10. $18 = (q \times 10) + 8$
- *11. $56 = (5 \times 10) + r$
12. $88 = (8 \times 10) + r$
13. $60 = (6 \times 10) + r$
14. $17 = (1 \times 10) + r$
15. $46 = (4 \times 10) + r$
16. $30 = (3 \times 10) + r$
- *17. $32 = (q \times 10) + r$
18. $35 = (q \times 10) + r$
19. $37 = (q \times 10) + r$
20. $47 = (q \times 10) + r$
21. $56 = (q \times 10) + r$
22. $50 = (q \times 10) + r$
23. $86 = (q \times 10) + r$
24. $99 = (q \times 10) + r$

Name the greatest number of tens and the ones left over for each.

- *25. 73 26. 14 27. 27 28. 69 29. 30 30. 47

Complete the table.

31. Number of cents	38	72	85	6
Greatest number of dimes	<u>?</u>	7	<u>?</u>	<u>?</u>
Pennies left over	8	<u>?</u>	<u>?</u>	<u>?</u>

Think Twice

When you find the greatest number of tens, what whole numbers from 0 through 100 have

32. 0 left over? 33. 1 left over? 34. 5 left over?

* 1. 6; 4 5. 3 11. 6 17. 3; 2 25. 7; 3

THE GREATEST NUMBER OF FIVES

Paul has 13 pennies. He needs nickels for the candy machine. Can you tell how many nickels he can get for 13¢?

A. Paul can get 1 nickel for each five pennies.

- How many fives are in 13?
How many ones are left over?
- 13 is 2 fives and 3 ones left over.
 $13 = (2 \times 5) + 3$
- Paul can get 2 nickels and have 3 pennies left over.



B. You can use the chart to find the greatest number of fives.

- Count the first 11 circles.
In 11, there are 2 rows of 5 and 1 left over.
- The number left over is called the **remainder**.
- To show that 11 is 2 fives and a remainder of 1, write:
 $11 = (2 \times 5) + 1$
- In 13, there are 2 fives and 1 left over.
 $13 = (\underline{\quad} \times 5) + \underline{\quad}$
- In 20, there are 4 fives and 0 left over.
 $20 = (\underline{\quad} \times 5) + \underline{\quad}$

1	2	3	4	5	1
6	7	8	9	10	2
11	12	13	14	15	3
16	17	18	19	20	4
21	22	23	24	25	5
26	27	28	29	30	6
31	32	33	34	35	7
36	37	38	39	40	8
41	42	43	44	45	9
46	47	48	49	50	10

✓ Tell the greatest number of fives and the remainder for each number from 6 through 50.

EXERCISES

Suppose q is the greatest number of fives and r is the number of ones left over. Find q , or r , or both.

*1. In 28, there are q fives and r left over.

2. In 30, there are q fives and r left over.

3. In 11, there are q fives and r left over.

4. In 2, there are q fives and r left over.

*5. $12 = (q \times 5) + 2$

6. $19 = (q \times 5) + 4$

7. $26 = (q \times 5) + 1$

8. $38 = (q \times 5) + 3$

9. $35 = (q \times 5) + 0$

10. $42 = (q \times 5) + 2$

*11. $8 = (1 \times 5) + r$

12. $14 = (2 \times 5) + r$

13. $26 = (5 \times 5) + r$

14. $34 = (6 \times 5) + r$

15. $49 = (9 \times 5) + r$

16. $50 = (10 \times 5) + r$

*17. $11 = (q \times 5) + r$

18. $13 = (q \times 5) + r$

19. $15 = (q \times 5) + r$

20. $18 = (q \times 5) + r$

21. $20 = (q \times 5) + r$

22. $22 = (q \times 5) + r$

23. $25 = (q \times 5) + r$

24. $29 = (q \times 5) + r$

25. $30 = (q \times 5) + r$

26. $31 = (q \times 5) + r$

27. $37 = (q \times 5) + r$

28. $40 = (q \times 5) + r$

29. $45 = (q \times 5) + r$

30. $47 = (q \times 5) + r$

Complete the table.

31. Number of cents	34	49	25	3
Greatest number of nickels	6	?	?	?
Pennies left over	?	4	?	?

Think Twice

When you find the greatest number of fives, what whole numbers from 0 through 50 leave a remainder of

32. 1?

33. 2?

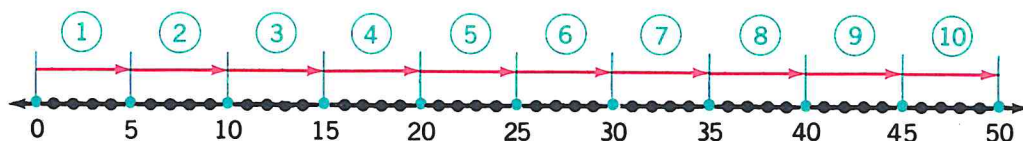
34. 3?

35. 4?

36. 0?

*1. 5; 3 5. 2 11. 3 17. 2; 1

USING INEQUALITIES



A. Find 47 on the number line.

- Why does each number in this set make $n \times 5 < 47$ true?

$$\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

- Name the greatest whole number that makes $n \times 5 < 47$ true.

B. What is the greatest whole number that makes $n \times 5 < 38$ true?

You can begin with a multiplication fact you know.

- You can think: $5 \times 5 = 25$, so there are at least 5 fives.

$$6 \times 5 = 30 \quad 7 \times 5 = 35 \quad 8 \times 5 = 40$$

Since 8 fives is too much, the answer is 7.

You can write $7 \times 5 < 38$.

EXERCISES

Write a true sentence, using the greatest whole number you can for n .

- | | | |
|-----------------------|-----------------------|-----------------------|
| *1. $n \times 5 < 11$ | 2. $n \times 5 < 9$ | 3. $n \times 5 < 18$ |
| 4. $n \times 5 < 34$ | 5. $n \times 5 < 48$ | 6. $n \times 5 < 27$ |
| 7. $n \times 5 < 13$ | *8. $n \times 5 < 4$ | 9. $n \times 5 < 17$ |
| 10. $n \times 5 < 41$ | 11. $n \times 5 < 22$ | 12. $n \times 5 < 36$ |
| 13. $n \times 5 < 6$ | 14. $n \times 5 < 44$ | 15. $n \times 5 < 19$ |
| 16. $n \times 5 < 47$ | 17. $n \times 5 < 39$ | 18. $n \times 5 < 2$ |
| 19. $n \times 5 < 28$ | 20. $n \times 5 < 8$ | 21. $n \times 5 < 43$ |
| 22. $n \times 5 < 37$ | 23. $n \times 5 < 31$ | 24. $n \times 5 < 24$ |
| 25. $n \times 5 < 46$ | 26. $n \times 5 < 16$ | 27. $n \times 5 < 29$ |
| 28. $n \times 5 < 1$ | 29. $n \times 5 < 12$ | 30. $n \times 5 < 21$ |

*1. $2 \times 5 < 11$ 8. $0 \times 5 < 4$

FINDING REMAINDERS

Suppose you want to find the greatest number of 5's in 34 and the remainder. Here is a way to find them.

- A.** You can ask the question "How many 5's in 34," using the symbol $\overline{)}$.

$$5 \overline{)34}$$

- Where is 34 written?
- Where is 5 written?

- B.** Find the greatest number of fives in 34.

$$5 \overline{)34}^6$$

- Where is 6 written?

- C.** You know that 6 fives is 30.
To find the remainder, write 30 below 34. Then subtract.

$$\begin{array}{r} 6 \\ 5 \overline{)34} \\ 6 \times 5 \rightarrow \underline{30} \\ 4 \end{array}$$

- $34 - 30 = \underline{\quad}$

- D.** Write r4 beside 6 to show that the remainder is 4.

$$\begin{array}{r} 6 \text{ r}4 \\ 5 \overline{)34} \\ \underline{30} \\ 4 \end{array}$$

- 34 is $\underline{\quad}$ fives with a remainder of $\underline{\quad}$.

EXERCISES

Find the greatest number of 5's and the remainder.

- | | | | | |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| *1. $5 \overline{)31}$ | 2. $5 \overline{)33}$ | 3. $5 \overline{)34}$ | 4. $5 \overline{)8}$ | 5. $5 \overline{)12}$ |
| 6. $5 \overline{)13}$ | 7. $5 \overline{)45}$ | 8. $5 \overline{)15}$ | 9. $5 \overline{)19}$ | 10. $5 \overline{)20}$ |
| 11. $5 \overline{)23}$ | 12. $5 \overline{)25}$ | 13. $5 \overline{)27}$ | 14. $5 \overline{)30}$ | 15. $5 \overline{)32}$ |
| 16. $5 \overline{)35}$ | 17. $5 \overline{)38}$ | 18. $5 \overline{)40}$ | 19. $5 \overline{)43}$ | 20. $5 \overline{)49}$ |

* 1. 6 r1

QUOTIENTS AND REMAINDERS

A. The greatest number of 5's in 42 is called the **quotient**.
$$\begin{array}{r} 8 \text{ r}2 \\ 5 \overline{)42} \end{array}$$

- So 8 is the quotient. The remainder is 2.
- Which number is the quotient in the second example? Which is the remainder?
$$\begin{array}{r} 8 \text{ r}0 \\ 5 \overline{)40} \end{array}$$

B. What are the remainders below? What is the greatest remainder possible when you divide by 5?

$$\begin{array}{r} 1 \text{ r}0 \\ 5 \overline{)5} \\ 5 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 1 \text{ r}1 \\ 5 \overline{)6} \\ 5 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1 \text{ r}2 \\ 5 \overline{)7} \\ 5 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 1 \text{ r}3 \\ 5 \overline{)8} \\ 5 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 1 \text{ r}4 \\ 5 \overline{)9} \\ 5 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 2 \text{ r}0 \\ 5 \overline{)10} \\ 10 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 2 \text{ r}1 \\ 5 \overline{)11} \\ 10 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 2 \text{ r}2 \\ 5 \overline{)12} \\ 10 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 2 \text{ r}3 \\ 5 \overline{)13} \\ 10 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 2 \text{ r}4 \\ 5 \overline{)14} \\ 10 \\ \hline 4 \end{array}$$

- ✓ Divide each member of this set by 5. {15, 16, 17, 18, 19}
Why is the remainder not greater than 4?

C. Which numbers can you divide by 5 and have a remainder of 0?
22 28 30 34 42 45 47

D. When the remainder is 0, the quotient is a factor of the number shown in blue. The quotients are shown in red.

- Which quotients are factors of the numbers shown in blue?

$$\begin{array}{r} 8 \text{ r}0 \\ 5 \overline{)40} \end{array}$$

$$\begin{array}{r} 7 \text{ r}2 \\ 10 \overline{)72} \end{array}$$

$$\begin{array}{r} 7 \text{ r}1 \\ 5 \overline{)36} \end{array}$$

$$\begin{array}{r} 3 \text{ r}1 \\ 5 \overline{)16} \end{array}$$

$$\begin{array}{r} 4 \text{ r}0 \\ 5 \overline{)20} \end{array}$$

$$17 = (3 \times 5) + 2$$

$$23 = (4 \times 5) + 3$$

$$35 = (7 \times 5) + 0$$

$$70 = (7 \times 10) + 0$$

$$89 = (8 \times 10) + 9$$

$$97 = (9 \times 10) + 7$$

EXERCISES

The quotient is shown in red. Write Yes or No to show if the quotient is a factor of the number shown in blue.

- *1. $5 \overline{)16}$ ^{3 r1} 2. $10 \overline{)22}$ ^{2 r2} 3. $5 \overline{)26}$ ^{5 r1} 4. $5 \overline{)30}$ ^{6 r0} 5. $10 \overline{)50}$ ^{5 r0}
- *6. $52 = (5 \times 10) + 2$ 7. $90 = (9 \times 10) + 0$
 8. $80 = (8 \times 10) + 0$ 9. $38 = (7 \times 5) + 3$
 10. $45 = (9 \times 5) + 0$ 11. $49 = (9 \times 5) + 4$

Find the answers. When the remainder is 0, you do not have to write r0.

- *12. $5 \overline{)28}$ 13. $5 \overline{)12}$ 14. $5 \overline{)38}$ 15. $5 \overline{)31}$ 16. $5 \overline{)15}$
 17. $5 \overline{)24}$ 18. $5 \overline{)41}$ 19. $5 \overline{)10}$ 20. $5 \overline{)23}$ 21. $5 \overline{)14}$
 22. $5 \overline{)19}$ 23. $5 \overline{)16}$ 24. $5 \overline{)33}$ 25. $5 \overline{)36}$ 26. $5 \overline{)27}$

27. How many 5-cent candy bars can Pete buy with 18 cents?
 How many cents will he have left over?
28. How many rows of 5 desks each can you make with 32 desks?
 How many desks will be left over?

Complete each sentence.

- *29. When you divide by 5, the greatest remainder is ? .
30. When you divide by 10, the greatest remainder is ? .
31. When you divide the numbers 1 through 100 by 10, the numbers that have a remainder of 0 are ? , ? , ? , ? , ? , ? , ? , ? , ? , ? .
32. When you divide the numbers 1 through 50 by 5, the numbers that have a remainder of 0 are ? , ? , ? , ? , ? , ? , ? , ? , ? , ? .
33. If the remainder is 0 when you divide a number by 5, then its numeral has ? or ? in the ones place.

PRACTICE IN MULTIPLYING AND DIVIDING

Write the answer only.

$$\begin{array}{r} 1. \quad 5 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 5 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 5 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 5 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 5 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 5 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 9 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 6 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 8 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 7 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 5 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 2 \\ \times 5 \\ \hline \end{array}$$

Solve.

$$13. 30 \div 6 = n$$

$$14. 5 \div 5 = n$$

$$15. 45 \div 5 = n$$

$$16. 10 \div 2 = n$$

$$17. 30 \div 5 = n$$

$$18. 15 \div 5 = n$$

$$19. 45 \div 9 = n$$

$$20. 5 \div 1 = n$$

$$21. 35 \div 5 = n$$

$$22. 50 \div 5 = n$$

$$23. 40 \div 8 = n$$

$$24. 40 \div 5 = n$$

$$25. 25 \div 5 = n$$

$$26. 20 \div 4 = n$$

$$27. 10 \div 5 = n$$

$$28. 5 \times 3 = n$$

$$29. 5 \times 8 = n$$

$$30. n \times 3 = 15$$

$$31. 6 \times 5 = n$$

$$32. 5 \times 5 = n$$

$$33. n \times 2 = 10$$

$$34. n \times 5 = 25$$

$$35. n \times 5 = 20$$

$$36. 6 \times n = 30$$

$$37. 5 \times n = 45$$

$$38. 7 \times n = 35$$

$$39. 5 \times n = 40$$

Find the quotient and the remainder.

$$40. 5 \overline{)11}$$

$$41. 5 \overline{)5}$$

$$42. 5 \overline{)22}$$

$$43. 5 \overline{)23}$$

$$44. 5 \overline{)32}$$

$$45. 5 \overline{)45}$$

$$46. 5 \overline{)27}$$

$$47. 5 \overline{)10}$$

$$48. 5 \overline{)37}$$

$$49. 5 \overline{)25}$$

$$50. 5 \overline{)13}$$

$$51. 5 \overline{)12}$$

$$52. 5 \overline{)28}$$

$$53. 5 \overline{)24}$$

$$54. 5 \overline{)29}$$

$$55. 5 \overline{)48}$$

$$56. 5 \overline{)20}$$

$$57. 5 \overline{)8}$$

$$58. 5 \overline{)14}$$

$$59. 5 \overline{)18}$$

$$60. 5 \overline{)43}$$

$$61. 5 \overline{)7}$$

$$62. 5 \overline{)35}$$

$$63. 5 \overline{)44}$$

$$64. 5 \overline{)47}$$

$$65. 5 \overline{)30}$$

$$66. 5 \overline{)17}$$

$$67. 5 \overline{)15}$$

$$68. 5 \overline{)42}$$

$$69. 5 \overline{)36}$$

HOW MANY SETS?

Gail has 46 pieces of candy. She wants to put 5 pieces in each bag. Can you tell how many bags she can fill?



A. Gail thought: "I must find the number of 5's in 46. I may have some ones left over."

- 46 is some fives and some ones left over.
- Gail wrote this example to help her find the answer.
- In 46, there are ? fives and ? one left over.
- How many bags can she fill?
How many ones are left over?

$$46 = (\underline{\quad} \times 5) + \underline{\quad}$$

$$\begin{array}{r} 9 \text{ r}1 \\ 5 \overline{)46} \\ 9 \times 5 \rightarrow \underline{45} \\ 1 \end{array}$$

$$46 = (9 \times 5) + 1$$

EXERCISES

Solve the problem. Write a number sentence if it helps you.

1. How many nickels can you get for 18 pennies?
How many pennies are left over?

2. You can make one apple pie with 5 apples.
How many can you make with 24 apples?
How many apples are left over?



3. How many dimes can you get for 93 pennies?
How many pennies are left over?

4. Hot dogs come 10 in a package. How many packages can you make from 76 hot dogs?
How many hot dogs are left over?



HOW MANY IN EACH SET?

Steve has 22 pennies. He wants to share them equally with his three friends and himself. Can you find how many pennies each of the 4 boys will get?



A. Steve can give out the pennies one at a time. But he thinks: "I can arrange the 22 pennies in 4 equivalent sets. I may have some left over."

- Steve wrote this example to help him find the answer. 22 makes 4 sets of ? and ? left over.
- How many pennies does each boy get?
What is left over?

$$22 = (4 \times \underline{\quad}) + \underline{\quad}$$

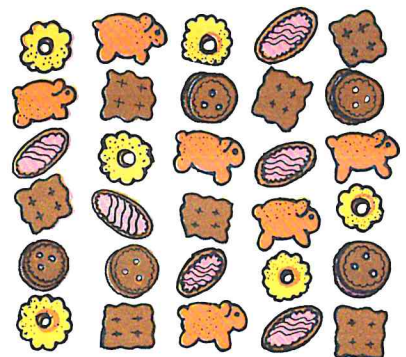
$$\begin{array}{r} 5 \text{ r}2 \\ 4 \overline{)22} \\ 5 \times 4 \rightarrow 20 \\ \underline{2} \end{array}$$

$$22 = (4 \times 5) + 2$$

EXERCISES

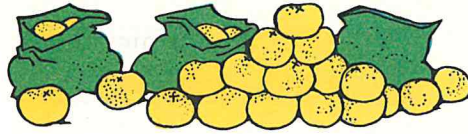
Solve each problem. Write a number sentence if it helps you.

1. Can 5 children share 16 cookies equally?
How many cookies will each child get? How many cookies will be left over?
2. Can 5 boys share 30 cookies equally with 0 left over?
How many will each get?



Solve each problem.

3. Can 43 grapefruits fill 8 sacks equally? What is the greatest number of grapefruits in each sack? How many are left over?



4. An apartment building has 100 apartments. The building has 10 floors. Each floor has the same number of apartments. How many are on each floor?



5. Judy colored 32 eggs.
She filled 6 baskets equally.
What is the greatest number of eggs in each basket?
How many are left over?



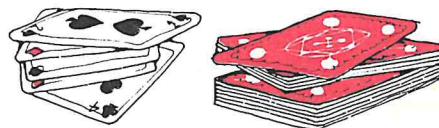
6. Tina set 8 places at the dinner table. She used 40 pieces of silverware. How many pieces were at each place?



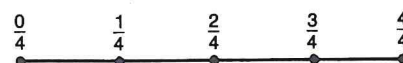
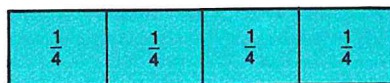
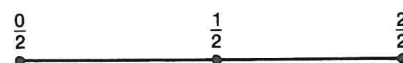
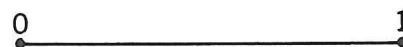
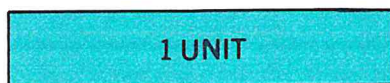
7. Four brothers shared 22¢ equally.
What is the greatest number of pennies each boy received?
How many were left?



8. In *Fly to the Moon*, 42 cards are dealt out equally to 5 players.
What is the greatest number of cards any player can get?
How many cards are left?



ORDERING FRACTIONAL NUMBERS



A. A rectangular region is shown above in three ways.

- Use the regions to compare these numbers.

$\frac{1}{2} \text{ and } \frac{2}{4}$

$1 \text{ and } \frac{2}{2}$

$1 \text{ and } \frac{4}{4}$

$\frac{2}{2} \text{ and } \frac{4}{4}$

B. The three line segments are as long as the regions.

- Use the segments to compare these numbers.

$\frac{1}{4} \text{ and } \frac{2}{4}$

$\frac{1}{2} \text{ and } \frac{3}{4}$

$\frac{1}{2} \text{ and } \frac{1}{4}$

$\frac{1}{2} \text{ and } 1$

EXERCISES

Write $<$, $=$, or $>$ to make each sentence true.

*1. $\frac{1}{4} \text{ } \frac{1}{2}$

2. $\frac{1}{4} \text{ } \frac{0}{4}$

3. $\frac{1}{4} \text{ } 1$

4. $\frac{2}{4} \text{ } \frac{1}{2}$

5. $\frac{2}{4} \text{ } \frac{4}{4}$

6. $\frac{2}{4} \text{ } \frac{2}{2}$

7. $\frac{2}{4} \text{ } 1$

8. $\frac{3}{4} \text{ } \frac{2}{4}$

9. $\frac{3}{4} \text{ } \frac{4}{4}$

10. $\frac{3}{4} \text{ } \frac{1}{2}$

11. $\frac{1}{2} \text{ } \frac{2}{4}$

12. $\frac{3}{4} \text{ } 1$

13. $\frac{4}{4} \text{ } \frac{2}{2}$

14. $\frac{4}{4} \text{ } 1$

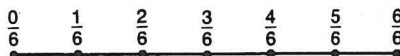
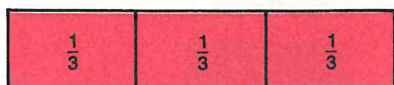
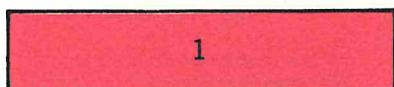
15. $1 \text{ } \frac{2}{2}$

16. $\frac{1}{1} \text{ } 1$

*1. $<$

Use the regions and line segments to help you.

Write $<$, $=$, or $>$ to make each sentence true.



* 17. $\frac{2}{6}$ ☐ $\frac{1}{6}$

18. $\frac{5}{6}$ ☐ $\frac{4}{6}$

19. $\frac{2}{3}$ ☐ $\frac{1}{3}$

20. $\frac{2}{3}$ ☐ $\frac{3}{3}$

21. $\frac{1}{3}$ ☐ $\frac{1}{6}$

22. $\frac{2}{3}$ ☐ $\frac{2}{6}$

23. $\frac{3}{3}$ ☐ $\frac{3}{6}$

24. $\frac{1}{6}$ ☐ $\frac{1}{3}$

25. $\frac{3}{3}$ ☐ $\frac{6}{6}$

26. $\frac{1}{3}$ ☐ $\frac{2}{6}$

27. $\frac{2}{3}$ ☐ $\frac{4}{6}$

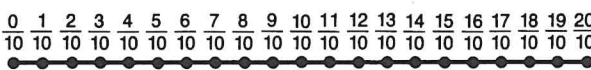
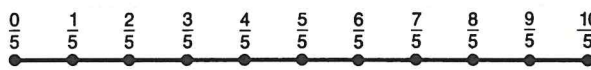
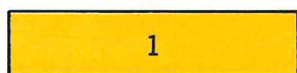
28. $\frac{1}{3}$ ☐ $\frac{5}{6}$

29. $\frac{2}{3}$ ☐ $\frac{3}{6}$

30. $\frac{2}{3}$ ☐ $\frac{5}{6}$

31. $\frac{1}{3}$ ☐ $\frac{3}{6}$

32. $\frac{6}{6}$ ☐ $\frac{3}{3}$



* 33. $\frac{4}{5}$ ☐ $\frac{5}{5}$

34. $\frac{1}{5}$ ☐ $\frac{0}{5}$

35. $\frac{2}{10}$ ☐ $\frac{1}{10}$

36. $\frac{9}{10}$ ☐ $\frac{10}{10}$

37. $\frac{1}{10}$ ☐ $\frac{1}{5}$

38. $\frac{2}{5}$ ☐ $\frac{2}{10}$

39. $\frac{10}{10}$ ☐ $\frac{5}{5}$

40. $\frac{5}{10}$ ☐ $\frac{2}{5}$

Write at least one fraction that shows the same amount.

Use the diagrams if you need help.

* 41. 0

42. 1

43. $\frac{1}{2}$

44. $\frac{1}{3}$

45. $\frac{1}{5}$

46. $\frac{2}{3}$

47. $\frac{5}{10}$

48. $\frac{8}{10}$

49. $\frac{2}{4}$

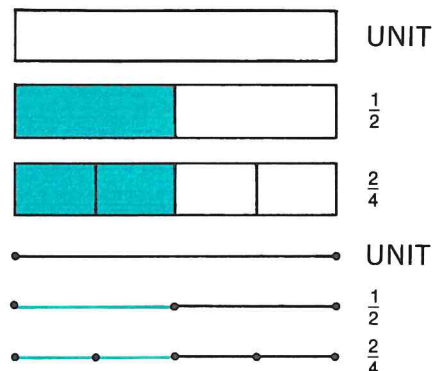
50. $\frac{6}{6}$

* 17. $>$ 33. $<$ 41. $\frac{0}{2}; \frac{0}{3}; \frac{0}{4}; \frac{0}{5}; \frac{0}{6};$ or $\frac{0}{10}$

DIFFERENT PAIRS FOR THE SAME NUMBER

A. Different pairs of numbers can name the same part.

- The pair (1, 2) shows 1 of 2 congruent pieces is blue.
What does the pair (2, 4) show?
- The numbers $\frac{1}{2}$ and $\frac{2}{4}$ show the amount. How do $\frac{1}{2}$ and $\frac{2}{4}$ compare?
- What do (1, 2) and (2, 4) show about the segments?
- How do $\frac{1}{2}$ and $\frac{2}{4}$ compare?

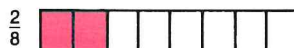
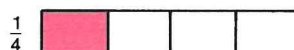
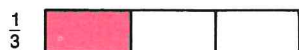


✓ Use the diagram. How do these fractions compare?

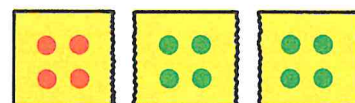
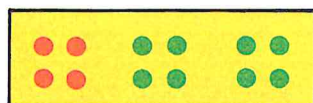
$\frac{1}{3} \text{ and } \frac{2}{6}$

$\frac{1}{4} \text{ and } \frac{2}{8}$

$\frac{1}{5} \text{ and } \frac{2}{10}$



B. Look at a set in two ways.



The fraction $\frac{4}{12}$ shows 4 out of a total of 12 are red. So $\frac{4}{12}$ of the set is red.

Think of 3 equivalent sets. 1 of the 3 sets is red. $\frac{1}{3}$ of the total is red.

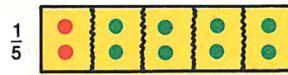
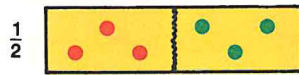
- Compare $\frac{4}{12}$ of the set with $\frac{1}{3}$ of the set.
What do you notice?

✓ How do these fractions compare?

$\frac{2}{6}$ and $\frac{1}{3}$



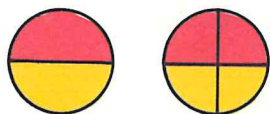
$\frac{2}{10}$ and $\frac{1}{5}$



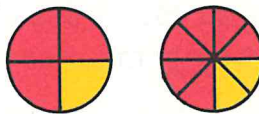
EXERCISES

The same part is shown in two ways. Write two fractions to show the part that is red.

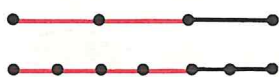
*1.



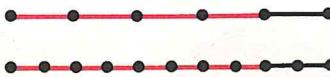
2.



3.



4.



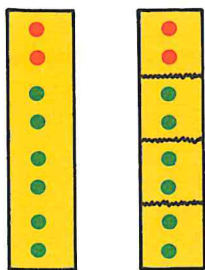
*5.



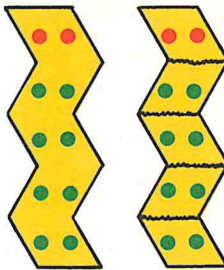
6.



7.



8.

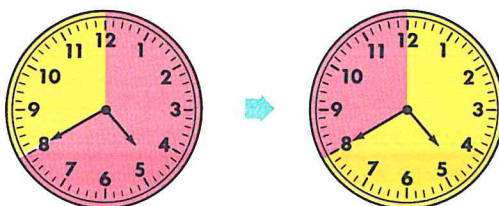


* 1. $\frac{1}{2}$; $\frac{2}{4}$

5. $\frac{4}{8}$; $\frac{1}{2}$

TELLING TIME

A. Look at the clock in two ways.



How many minutes past
4 o'clock does the
clock show?

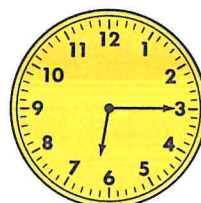
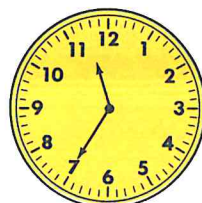
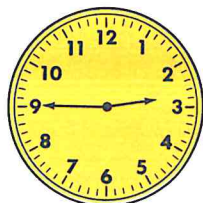
The time is 4:40.

How many minutes before
5 o'clock does the
clock show?

What time is it?

- What do you notice about forty minutes past 4 o'clock and twenty minutes before 5 o'clock?

✓ Tell each time in two ways. Then write the time.



EXERCISES

Complete the chart. Write only the answer.

1. 6:40	40 minutes after 6	20 minutes before 7
2. 10:15	? minutes after ?	? minutes before ?
3. 7:30	? minutes after ?	? minutes before ?
4. 2:45	? minutes after ?	? minutes before ?
5. 12:50	? minutes after ?	? minutes before ?
6. 4:05	? minutes after ?	? minutes before ?

KEEPING UP IN MATHEMATICS

Copy and complete.

1. Count by twos. [16]

2	4	6	8	?
?	14	16	?	20
22	?	26	?	30
?	?	?	38	?
42	44	?	?	?

2. Count by tens. [28, 30]

0	10	20	30
?	50	?	?
80	90	?	110
?	130	?	150
160	170	?	190
?	?	220	?
240	?	?	270

3. Count by hundreds. [29, 30]

0	100	200
?	400	?
?	700	?
900	?	1100

Complete each set. [16]

4. {1, 3, 5, ?, ?, ?}
5. {10, 8, 6, ?, ?, ?}
6. {0, 2, 4, ?, ?, ?}
7. {21, 19, 17, ?, ?, ?}

What number is 10 less than each of the following. [30]

8. 40 9. 75 10. 69
11. 22 12. 14 13. 37
14. 85 15. 185 16. 100

What number is 10 greater than each of the following. [30]

17. 50 18. 13 19. 39
20. 7 21. 25 22. 41
23. 68 24. 168 25. 100

What number is 100 greater than each of the following. [30]

26. 0 27. 300 28. 350
29. 652 30. 764 31. 64
32. 7 33. 13 34. 99

What number is 100 less than each of the following. [30]

35. 200 36. 100 37. 752
38. 647 39. 895 40. 1000
41. 393 42. 531 43. 250

Write a decimal numeral for each Roman numeral. [103]

44. X 45. VI 46. III
47. V 48. IX 49. VII
50. IV 51. VIII 52. XI

CHECKPOINT

✓ Check your understanding of **key terms**.

Use each in a sentence.

quotient

remainder

✓ Check your understanding of **key ideas**.

1a. Find the remainder.

$$13 = (2 \times 5) + r$$

$$14 = (2 \times 5) + r$$

$$15 = (3 \times 5) + r$$

1b. When you find the greatest number of 5's in a number, what is the greatest possible remainder?

2a. Find the quotient.

$$5 \overline{)25}$$

$$10 \overline{)50}$$

2b. When is a quotient also a factor of a number?

✓ Check your **skills**.

What is the greatest whole number that makes the sentence true?

1. $n \times 10 < 11$

2. $n \times 10 < 28$

3. $n \times 10 < 9$

4. $n \times 10 < 47$

5. $n \times 5 < 14$

6. $n \times 5 < 32$

7. $n \times 5 < 26$

8. $n \times 5 < 44$

9. $n \times 5 < 3$

10. $n \times 5 < 38$

11. $n \times 5 < 23$

12. $n \times 5 < 19$

Find the quotient and remainder.

13. $5 \overline{)12}$

14. $5 \overline{)29}$

15. $5 \overline{)10}$

16. $5 \overline{)13}$

17. $5 \overline{)34}$

18. $5 \overline{)42}$

19. $5 \overline{)21}$

20. $5 \overline{)6}$

21. $5 \overline{)9}$

22. $5 \overline{)17}$

23. $5 \overline{)38}$

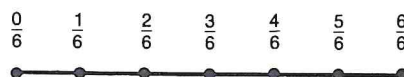
24. $5 \overline{)43}$

Replace \odot with $<$, $=$, or $>$. Use the segments to help you.



25. $\frac{2}{6} \odot \frac{3}{6}$

26. $\frac{1}{3} \odot \frac{1}{6}$



27. $\frac{5}{6} \odot \frac{2}{3}$

28. $\frac{6}{6} \odot \frac{3}{3}$

UNIT TEST

Find the answers.

1. Which number is greater, $\frac{1}{2}$ or $\frac{1}{4}$?
2. It is 25 minutes after 5 o'clock.
How many minutes before 6 o'clock is it?
3. What is the greatest whole number that makes this sentence true? $n \times 5 < 28$
4. What is the greatest remainder you can have when you are dividing by 10?
5. How many 10¢ candy bars can Tony buy with 25¢?
6. If 5 boys share 20 cookies equally, how many cookies will each boy get?

Complete each sentence.

7. $34 = (3 \times 10) + \underline{\quad ? \quad}$

8. $18 = (\underline{\quad ? \quad} \times 5) + 3$

Find the quotients and the remainders.

9. $5 \overline{)12}$

10. $10 \overline{)66}$

If you have time, try these.

11. Arrange these numbers in order. Begin with the least.

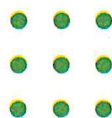
$$\left\{ \frac{1}{6}, 0, \frac{1}{2}, 1, \frac{1}{3} \right\}$$

12. Name five numbers that make $\square \times 1 = \square$ true.

MATHAMUSEMENTS

How many different squares can you make by connecting some or all of these dots?

Hint: (All the squares will not be the same size.)

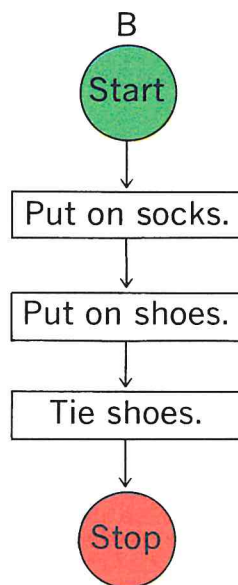
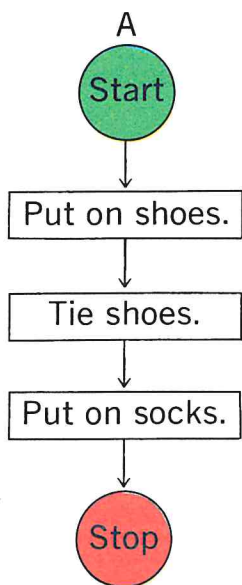


INQUIRY INTO CHARTING

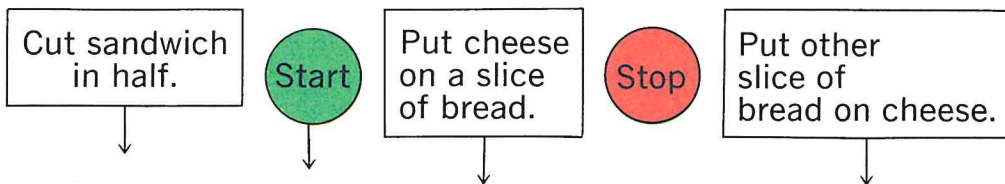
Flow Charts

Mathematicians use flow charts to tell computers what to do. You can make a simple flow chart to show the order of steps you use to do something.

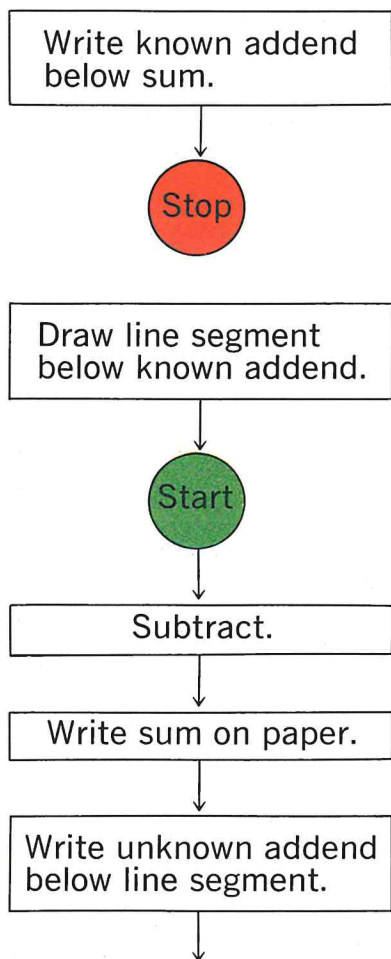
- Diagrams A and B are flow charts. Which flow chart shows how you put on your shoes and socks?



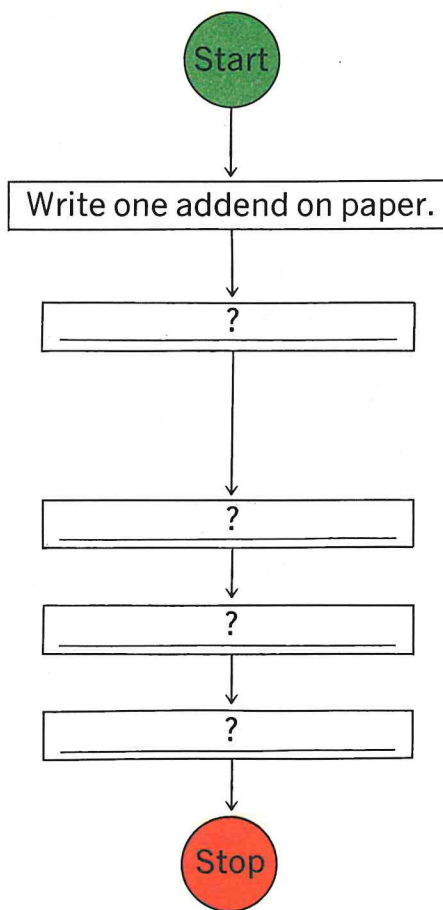
You have a slice of cheese and two slices of bread. You want to make a cheese sandwich. Arrange the steps below to make a flow chart to show how.



- You have two numbers—a sum and an addend. Arrange the steps to make a flow chart that shows how to find the other addend.



- You have two numbers. Both are addends. Copy and complete the flow chart to show how to find their sum.



- Make a flow chart to show how you would multiply two numbers that are both less than 10.

For Further Inquiry

You have a letter, an envelope, a stamp, and a mailbox. Make a flow chart showing how you would mail a letter.

EXPLORING WITH 2 AS A FACTOR

- A.** How do you look at the eggs to see each number sentence?



$$2 + 2 + 2 + 2 + 2 + 2 = 12$$

$$6 + 6 = 12$$

$$6 \times 2 = 12$$

$$2 \times 6 = 12$$

$$12 \div 6 = 2$$

$$12 \div 2 = 6$$

- B.** Use the square regions to help you find n .

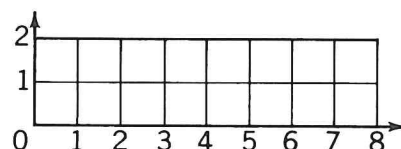
■ 8 twos = n 2 eights = n

$$8 \times 2 = n \quad 2 \times 8 = n$$

■ 16 is n twos. 16 is n eights.

$$16 = n \times 2 \quad 16 = n \times 8$$

$$16 \div 2 = n \quad 16 \div 8 = n$$



- C.** Write two multiplication and two division sentences for each.

■ {4, 2, 8} {6, 2, 12} {8, 2, 16} {10, 2, 20}

- D.** Why are these addition facts called doubles?

$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$	$\begin{array}{r} 2 \\ +2 \\ \hline 4 \end{array}$	$\begin{array}{r} 3 \\ +3 \\ \hline 6 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$	$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$	$\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$
--	--	--	--	---	---	---	---	---

- Use the “doubles” for addition to solve these sentences.

$$\begin{array}{l} 2 \text{ ones} = a \\ 2 \times 1 = a \end{array}$$

$$\begin{array}{l} 2 \text{ twos} = b \\ 2 \times 2 = b \end{array}$$

$$\begin{array}{l} 2 \text{ threes} = c \\ 2 \times 3 = c \end{array}$$

$$\begin{array}{l} 2 \text{ fours} = d \\ 2 \times 4 = d \end{array}$$

$$\begin{array}{l} 2 \text{ fives} = e \\ 2 \times 5 = e \end{array}$$

$$\begin{array}{l} 2 \text{ sixes} = f \\ 2 \times 6 = f \end{array}$$

$$\begin{array}{l} 2 \text{ sevens} = g \\ 2 \times 7 = g \end{array}$$

$$\begin{array}{l} 2 \text{ eights} = h \\ 2 \times 8 = h \end{array}$$

$$\begin{array}{l} 2 \text{ nines} = i \\ 2 \times 9 = i \end{array}$$

$$\begin{array}{l} 6 = j \text{ threes} \\ 6 = j \times 3 \\ 6 \div 3 = j \end{array}$$

$$\begin{array}{l} 14 = k \text{ sevens} \\ 14 = k \times 7 \\ 14 \div 7 = k \end{array}$$

$$\begin{array}{l} 18 = n \text{ nines} \\ 18 = n \times 9 \\ 18 \div 9 = n \end{array}$$

EXERCISES

Use the square regions to find n .

*1. 2 twos = n

$$2 \times 2 = n$$

2. 3 twos = n

$$3 \times 2 = n$$

3. 4 twos = n

$$4 \times 2 = n$$

4. 5 twos = n

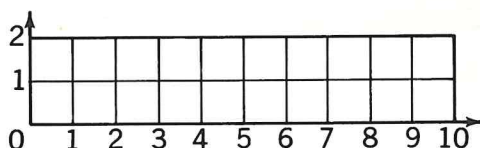
$$5 \times 2 = n$$

5. $6 \times 2 = n$

6. $7 \times 2 = n$

7. $8 \times 2 = n$

8. $9 \times 2 = n$



9. 2 threes = n

$$2 \times 3 = n$$

10. 2 fours = n

$$2 \times 4 = n$$

11. 2 fives = n

$$2 \times 5 = n$$

12. $2 \times 6 = n$

13. $2 \times 7 = n$

14. $2 \times 8 = n$

15. $4 = n$ twos

$$4 = n \times 2$$

16. $6 = n$ twos

$$6 = n \times 2$$

17. $8 = n$ twos

$$8 = n \times 2$$

18. $14 = n$ twos

$$14 = n \times 2$$

19. $16 = n$ twos

$$16 = n \times 2$$

20. $18 = n$ twos

$$18 = n \times 2$$

Write two multiplication and two division sentences for each.

*21. $\{2, 8, 16\}$ 22. $\{2, 9, 18\}$ 23. $\{5, 10, 2\}$ 24. $\{2, 6, 12\}$

Solve.

*25. $2 \div 2 = n$

26. $4 \div 2 = n$

27. $6 \div 2 = n$

28. $8 \div 2 = n$

29. $10 \div 2 = n$

30. $12 \div 2 = n$

31. $14 \div 2 = n$

32. $16 \div 2 = n$

33. $18 \div 2 = n$

Think Twice

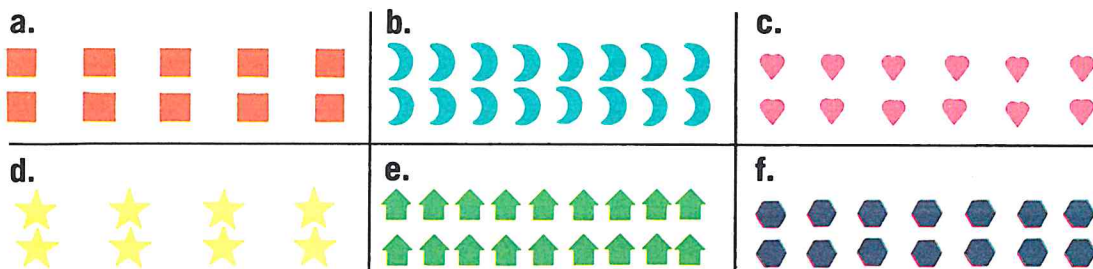
34. Begin with 0. Count by twos until you reach 20.

$\{0, 2, 4, 6, \dots, 20\}$. Each number is called a multiple of 2.

What digits can be in the ones place for multiples of 2?

*1. 4; 4 21. $2 \times 8 = 16$; $8 \times 2 = 16$; $16 \div 2 = 8$; $16 \div 8 = 2$ 25. 1

COMMUTATIVE PROPERTY OF MULTIPLICATION



A. How can you look at picture **a** to see 5 twos? 2 fives?
What do you notice about 5×2 and 2×5 ?

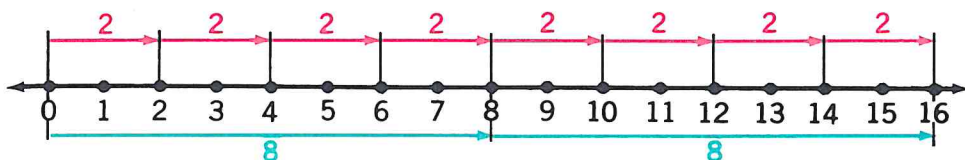
■ Which picture shows each pair of products?

4×2	6×2	7×2	8×2	9×2
2×4	2×6	2×7	2×8	2×9

■ What do you notice about the pairs?

Give the simplest name for each product.

B. Use the number line.



■ The red arrows show that $8 \times 2 = \underline{\quad ? \quad}$.

■ The blue arrows show that $2 \times 8 = \underline{\quad ? \quad}$.

■ Since $8 \times 2 = 16$ and $2 \times 8 = 16$, then $8 \times 2 = 2 \times 8$.

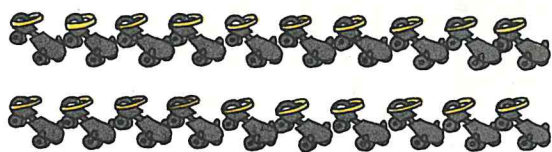
Changing the order of two factors does not change their product. If a and b are any whole numbers, then $a \times b = b \times a$. This is the **commutative property of multiplication**.

✓ Give four pairs of numbers that make $a \times b = b \times a$ true.

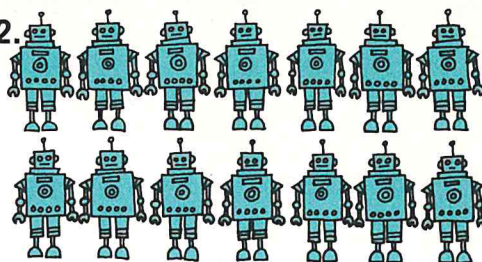
EXERCISES

Write two multiplication sentences for each picture.

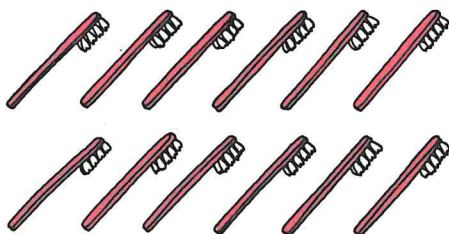
* 1.



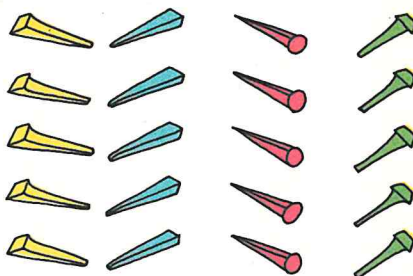
2.



3.



4.



Complete each sentence.

* 5. $2 \times 8 = 16$, so $8 \times 2 = ?$

6. $4 \times 5 = 20$, so $5 \times 4 = ?$

7. $7 \times 10 = 70$, so $10 \times 7 = ?$

8. $9 \times 10 = 90$, so $10 \times 9 = ?$

9. $6 \times 10 = 60$, so $10 \times 6 = ?$

10. $3 \times 20 = 60$, so $20 \times 3 = ?$

11. $2 \times 300 = 600$, so $300 \times 2 = ?$

12. $2 \times 500 = 1000$, so $500 \times 2 = ?$

Write *True* or *False*.

* 13. $3 \times 2 = 2 \times 3$

14. $4 \times 3 = 5 \times 2$

15. $5 \times 8 = 7 \times 5$

16. $10 \times 15 = 15 \times 10$

17. $400 \times 25 = 25 \times 400$

18. $6 \times 2 = 2 \times 6$

19. $6 \div 2 = 2 \div 6$

20. $6 + 2 = 2 + 6$

21. $6 - 2 = 2 - 6$

Think Twice

Replace \bullet with $=$ or \neq (is not equal to) to make the sentence true.

22. $4 \times (2 \times 10) \bullet 4 \times (10 \times 2)$

23. $8 \times (6 \times 4) \bullet 8 \times (3 \times 6)$

24. $6 \times (2 + 3) \bullet (6 \times 2) + 3$

25. $(16 \div 4) \div 4 \bullet 16 \div (4 \div 4)$

* 1. $10 \times 2 = 20$; $2 \times 10 = 20$

5. 16

13. True.

PROPERTIES OF ONE AND ZERO

A. Find the number that makes each sentence true.

$6 \text{ ones} = n$	$7 \text{ ones} = a$	$5 \text{ ones} = b$	$12 \text{ ones} = c$
$6 \times 1 = n$	$7 \times 1 = a$	$5 \times 1 = b$	$12 \times 1 = c$

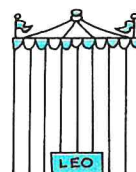
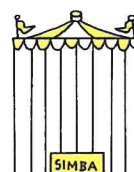
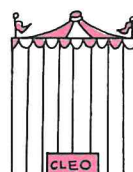
B. Use the commutative property of multiplication.

■ $3 \times 1 = 3$, so $1 \times 3 = \underline{\quad}$	■ $8 \times 1 = 8$, so $1 \times 8 = \underline{\quad}$
■ $61 \times 1 = 61$, so $1 \times 61 = \underline{\quad}$	■ $29 \times 1 = 29$, so $1 \times 29 = \underline{\quad}$

✓ Make a rule about finding the product of any number and 1.

$a \times 1 = \underline{\quad}$
 $1 \times a = \underline{\quad}$

C. These cages are for lions.
 How many lions are in each cage?
 The three empty cages contain ? lions.



■ How can you use the addition sentence to solve the multiplication sentence?

$$0 + 0 + 0 = 0$$

$$3 \times 0 = \underline{\quad}$$

■ Name the number that makes each sentence true.

$0 + 0 + 0 + 0 = d$	$0 + 0 = c$	$0 = f$
$4 \times 0 = d$	$2 \times 0 = c$	$1 \times 0 = f$

D. Use the commutative property of multiplication.

■ $5 \times 0 = 0$, so $0 \times 5 = \underline{\quad}$	■ $8 \times 0 = 0$, so $0 \times 8 = \underline{\quad}$
■ $17 \times 0 = 0$, so $0 \times 17 = \underline{\quad}$	■ $39 \times 0 = 0$, so $0 \times 39 = \underline{\quad}$

✓ Make a rule about finding the product of any number and 0.

$a \times 0 = \underline{\quad}$
 $0 \times a = \underline{\quad}$

EXERCISES

Solve each sentence.

- | | | |
|----------------------|----------------------|----------------------|
| *1. $7 \times 2 = n$ | 2. $6 \times 2 = n$ | 3. $5 \times 2 = n$ |
| 4. $4 \times 2 = n$ | 5. $3 \times 2 = n$ | 6. $2 \times 2 = n$ |
| 7. $1 \times 2 = n$ | *8. $0 \times 2 = n$ | 9. $7 \times 0 = n$ |
| 10. $6 \times 0 = n$ | 11. $5 \times 0 = n$ | 12. $4 \times 0 = n$ |
| 13. $3 \times 0 = n$ | 14. $2 \times 0 = n$ | 15. $1 \times 0 = n$ |
| 16. $0 \times 0 = n$ | 17. $2 \times 1 = n$ | 18. $1 \times 1 = n$ |

Write only the answer.

- | | | | | |
|---|--|--|--|--|
| *19. $\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$ | 20. $\begin{array}{r} 12 \\ \times 1 \\ \hline \end{array}$ | *21. $\begin{array}{r} 4 \\ \times 0 \\ \hline \end{array}$ | 22. $\begin{array}{r} 146 \\ \times 1 \\ \hline \end{array}$ | 23. $\begin{array}{r} 84 \\ \times 0 \\ \hline \end{array}$ |
| 24. $\begin{array}{r} 0 \\ \times 50 \\ \hline \end{array}$ | 25. $\begin{array}{r} 1 \\ \times 163 \\ \hline \end{array}$ | 26. $\begin{array}{r} 506 \\ \times 0 \\ \hline \end{array}$ | 27. $\begin{array}{r} 1 \\ \times 924 \\ \hline \end{array}$ | 28. $\begin{array}{r} 897 \\ \times 1 \\ \hline \end{array}$ |

Copy and complete each of the following.

- | | |
|--|--|
| *29. Since $1 \times 6 = 6$,
$6 \div 6 = \underline{\quad}$ and $6 \div 1 = \underline{\quad}$ | 30. Since $1 \times 47 = 47$,
$47 \div 47 = \underline{\quad}$ and $47 \div 1 = \underline{\quad}$ |
| 31. $7 \div 7 = \underline{\quad}$ | 32. $25 \div 1 = \underline{\quad}$ |
| 33. $9 \div 9 = \underline{\quad}$ | |
| 34. $\begin{array}{r} ?? \\ 1 \overline{)26} \end{array}$ | 35. $\begin{array}{r} ? \\ 33 \overline{)33} \end{array}$ |
| 36. $\begin{array}{r} ??? \\ 1 \overline{)289} \end{array}$ | |
| 37. If you divide any counting number n by 1, you get $\underline{\quad}$. | $n \div 1 = \underline{\quad}$ |
| 38. If you divide any counting number n by itself, you get $\underline{\quad}$. | $n \div n = \underline{\quad}$ |



Think Twice

How many numbers make each sentence true?

- | | | |
|----------------------|----------------------|--------------------|
| 39. $7 \times n = 0$ | 40. $n \times 1 = n$ | 41. $n \div n = 1$ |
|----------------------|----------------------|--------------------|

* 1. 14 8. 0 19. 2 21. 0 29. 1; 6

MULTIPLICATION FACTS WITH 2 AS A FACTOR

- A.** There are 9 people at Nancy's party. 
 Each is given 2 cookies.
 How many cookies are given in all? 
 ■ Count by twos to find the answer.

- B.** Read the table below. Begin: "Zero times two is zero. One times two is two."

Multiplication facts with 2 as a factor

2	2	2	2	2	2	2	2	2	2
$\times 0$	$\times 1$	$\times 2$	$\times 3$	$\times 4$	$\times 5$	$\times 6$	$\times 7$	$\times 8$	$\times 9$
0	2	4	6	8	10	12	14	16	18

- C.** Write ten more multiplication facts with 2 as a factor.
 Use the commutative property of multiplication.

EXERCISES

Practice until you can write every answer correctly.

1. $\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$	2. $\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$	3. $\begin{array}{r} 0 \\ \times 2 \\ \hline \end{array}$	4. $\begin{array}{r} 2 \\ \times 8 \\ \hline \end{array}$	5. $\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	6. $\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$
---	---	---	---	---	---

7. $\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$	8. $\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$	9. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$	10. $\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$	11. $\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$	12. $\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$
---	---	---	--	--	--

13. $\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$	14. $\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$	15. $\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$	16. $\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$	17. $\begin{array}{r} 1 \\ \times 2 \\ \hline \end{array}$	18. $\begin{array}{r} 2 \\ \times 0 \\ \hline \end{array}$
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KEEPING UP IN MATHEMATICS

Are the sets equivalent?

Write Yes or No. [2-3, 132-33]

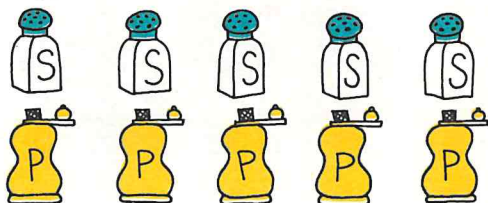
1.



2.



3.



Complete each sentence.

[17, 103, 136, 142]

4. 5 days in a school week.

4 weeks in May.

 school days in May.

5. 10 ice cubes in a tray.

2 trays. ice cubes.

6. 10¢ is worth as much

as nickels.

7. 50¢ is worth as much

as dimes.

8. 50¢ is worth as much

as nickels.

9. 100¢ is worth as much

as half dollars.

Solve. [135-37, 142-44]

10. $n \times 5 = 45$

11. $n \times 5 = 15$

12. $n \times 5 = 5$

13. $n \times 5 = 35$

14. $n \times 10 = 60$

15. $n \times 10 = 40$

16. $40 \div 5 = n$

17. $25 \div 5 = n$

18. $30 \div 5 = n$

19. $10 \div 5 = n$

Name the greatest number of tens in each number. Then name the number of ones left over.

[154-55]

20. 39

21. 54

22. 21

23. 45

24. 28

25. 9

Name the greatest number of fives in each number. Then name the number of ones left over.

[156-57]

26. 18

27. 42

28. 37

29. 30

30. 26

31. 14

Replace ● with <, =, or >.

[135-37]

32. $6 \times 5 \text{ } \bullet \text{ } 27$

33. $5 \times 10 \text{ } \bullet \text{ } 48$

34. $5 \times 0 \text{ } \bullet \text{ } 5$

35. $10 \times 6 \text{ } \bullet \text{ } 60$

USING 2 IN MULTIPLICATION

- A.** Mints cost 2¢ each.
Mary and Jack found the cost of 6 mints.



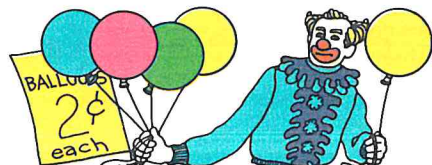
Mary's Way
 $2 + 2 + 2 + 2 + 2 + 2 = 12$

Jack's Way
 $6 \times 2 = 12$

- How do you think to find the cost of the mints?

- B.** Balloons cost 2¢ each.
How much do 5 balloons cost?

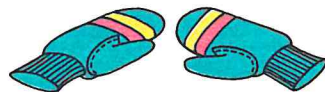
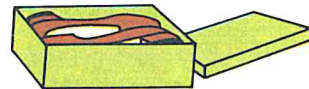
- You can think: One balloon costs 2 cents. Five balloons cost 5 times 2 cents, or cents.
- $5 \times 2 = \underline{\quad}$



EXERCISES

Tell what you think to answer each question.

- There are 2 nuts in a shell.
How many nuts are in 3 shells?
- There are 2 straws in a wrapper.
How many straws are in 7 wrappers?
- There are 2 shoes in each box.
How many shoes are in 4 boxes?
- There are 2 mittens in a pair.
How many mittens are in 6 pairs?



Find the answer.

5. There are 2 children playing on each seesaw. How many children can play on 5 seesaws?



6. There are 2 sticks for each drum. How many sticks come with 2 drums?



7. There are 2 earrings in a pair. How many earrings are there in 8 pairs?



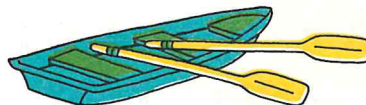
8. There are 2 handles on a basket. How many handles are there on 4 baskets?



9. There are 2 skates in a pair. How many skates are there in 9 pairs?



10. There are 2 oars in each boat. How many oars are there in 3 boats?



11. There are 2 sticks in an icepop. How many sticks are there in 5 icepops?



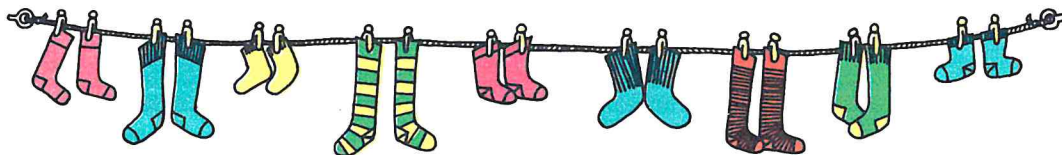
12. There are 2 wheels on a bicycle. How many wheels are there on 6 bicycles?



13. There are 2 hands on a clock. How many hands are there on 7 clocks?

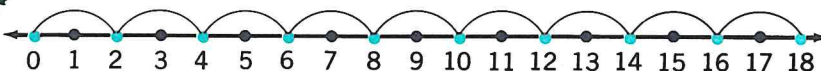


DIVIDING BY 2



- A.** There are 18 socks hanging on a line. There are 2 socks in a pair of socks. Can you find how many pairs of socks are on the line?

- You can count by twos $\quad \quad \quad ? \text{ twos} = 18$
until you come to 18. $\quad \quad \quad n \times 2 = 18$
How many twos do you count?
- You can use a multiplication fact you know.
Since $9 \times 2 = 18$, then $18 \div 2 = ?$.



- B.** Each hop covers 2 units. Count the hops to reach 12.

- Since $? \times 2 = 12$, then $12 \div 2 = ?$.
- Use the number line to help solve each sentence.

$$\begin{array}{|l} n \times 2 = 10 \\ 10 \div 2 = n \end{array}$$

$$\begin{array}{|l} n \times 2 = 8 \\ 8 \div 2 = n \end{array}$$

$$\begin{array}{|l} n \times 2 = 14 \\ 14 \div 2 = n \end{array}$$

$$\begin{array}{|l} n \times 2 = 18 \\ 18 \div 2 = n \end{array}$$

EXERCISES

Complete each sentence. Use the picture if you need help.

1. There are $? \text{ 2's in } 12$. $12 \div 2 = ?$
There are $? \text{ 6's in } 12$. $12 \div 6 = ?$



2. There are $? \text{ 2's in } 14$. $14 \div 2 = ?$
There are $? \text{ 7's in } 14$. $14 \div 7 = ?$

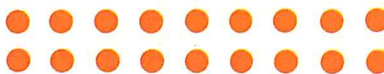


Complete each sentence.

3. There are ? 2's in 16. $16 \div 2 = \underline{\quad}$
 There are ? 8's in 16. $16 \div 8 = \underline{\quad}$



4. There are ? 2's in 18. $18 \div 2 = \underline{\quad}$
 There are ? 9's in 18. $18 \div 9 = \underline{\quad}$



- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| 5. $3 + 3 = 6$ | 6. $2 + 2 + 2 = 6$ | 7. $6 + 6 = 12$ |
| 6 is <u> ? </u> 3's. | 6 is <u> ? </u> 2's. | 12 is <u> ? </u> 6's. |
| $6 \div 3 = \underline{\quad}$ | $6 \div 2 = \underline{\quad}$ | $12 \div 6 = \underline{\quad}$ |

What division fact can you write from this sentence?

8. $2 + 2 + 2 + 2 + 2 + 2 = 12$

Copy and write the answers.

- | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|
| *9. $10 \div 2 = \underline{\quad}$ | 10. $12 \div 6 = \underline{\quad}$ | 11. $6 \div 2 = \underline{\quad}$ |
| 12. $18 \div 2 = \underline{\quad}$ | 13. $14 \div 7 = \underline{\quad}$ | 14. $16 \div 8 = \underline{\quad}$ |
| 15. $18 \div 9 = \underline{\quad}$ | 16. $14 \div 2 = \underline{\quad}$ | 17. $16 \div 2 = \underline{\quad}$ |
| 18. $12 \div 2 = \underline{\quad}$ | 19. $10 \div 5 = \underline{\quad}$ | 20. $6 \div 3 = \underline{\quad}$ |

Find the answer. Use the number line in **B** if you need to.

21. Lollipops cost 2¢ each. How many can you buy for 10¢?
22. A sandwich is made with 2 slices of bread. How many sandwiches can be made with 8 slices?
23. How many gumdrops are needed to make a bird?
 How many birds can you make with 10 gumdrops?
24. How many gumdrops are needed to make a cat? How many cats can you make with 10 gumdrops?



DIVISION FACTS WITH 2 AS A FACTOR

A. Read the table below. Begin: “How many twos equal two? One. How many twos equal four? Two.”

Division facts with 2 as a factor								
$\begin{array}{r} 1 \\ 2 \overline{)2} \end{array}$	$\begin{array}{r} 2 \\ 2 \overline{)4} \end{array}$	$\begin{array}{r} 3 \\ 2 \overline{)6} \end{array}$	$\begin{array}{r} 4 \\ 2 \overline{)8} \end{array}$	$\begin{array}{r} 5 \\ 2 \overline{)10} \end{array}$	$\begin{array}{r} 6 \\ 2 \overline{)12} \end{array}$	$\begin{array}{r} 7 \\ 2 \overline{)14} \end{array}$	$\begin{array}{r} 8 \\ 2 \overline{)16} \end{array}$	$\begin{array}{r} 9 \\ 2 \overline{)18} \end{array}$
$\begin{array}{r} 2 \\ 1 \overline{)2} \end{array}$	$\begin{array}{r} 2 \\ 2 \overline{)4} \end{array}$	$\begin{array}{r} 2 \\ 3 \overline{)6} \end{array}$	$\begin{array}{r} 2 \\ 4 \overline{)8} \end{array}$	$\begin{array}{r} 2 \\ 5 \overline{)10} \end{array}$	$\begin{array}{r} 2 \\ 6 \overline{)12} \end{array}$	$\begin{array}{r} 2 \\ 7 \overline{)14} \end{array}$	$\begin{array}{r} 2 \\ 8 \overline{)16} \end{array}$	$\begin{array}{r} 2 \\ 9 \overline{)18} \end{array}$

■ Now read the facts another way. Begin: “Two divided by two equals one. Four divided by two equals two.”

EXERCISES

Practice until you can write every answer correctly.

1. $2 \overline{)16}$
2. $3 \overline{)6}$
3. $2 \overline{)14}$
4. $5 \overline{)10}$
5. $4 \overline{)8}$
6. $2 \overline{)2}$
7. $7 \overline{)14}$
8. $2 \overline{)10}$
9. $8 \overline{)16}$
10. $2 \overline{)8}$
11. $9 \overline{)18}$
12. $1 \overline{)2}$
13. $2 \overline{)12}$
14. $2 \overline{)18}$
15. $2 \overline{)4}$

Solve.

- | | | |
|------------------------|-----------------------|-----------------------|
| *16. $2 \times n = 18$ | 17. $n \times 2 = 16$ | 18. $7 \times n = 14$ |
| 19. $n \times 2 = 12$ | 20. $2 \times n = 14$ | 21. $4 \times n = 8$ |
| 22. $9 \times n = 18$ | 23. $n \times 8 = 16$ | 24. $2 \times n = 2$ |

Write two multiplication and two division facts for each.

- *25. {4, 2, 8} 26. {2, 3, 6} 27. {2, 7, 14} 28. {2, 5, 10}

* 16. 9 25. $4 \times 2 = 8$; $2 \times 4 = 8$; $8 \div 4 = 2$; $8 \div 2 = 4$

ADDITION AND SUBTRACTION PRACTICE

Write only the answers.

- | | |
|---|---|
| 1. $47 + 10 = \underline{\quad ? \quad}$ | 2. $47 + 20 = \underline{\quad ? \quad}$ |
| 3. $47 + 21 = \underline{\quad ? \quad}$ | 4. $47 + 32 = \underline{\quad ? \quad}$ |
| 5. $47 - 10 = \underline{\quad ? \quad}$ | 6. $47 - 20 = \underline{\quad ? \quad}$ |
| 7. $47 - 21 = \underline{\quad ? \quad}$ | 8. $47 - 32 = \underline{\quad ? \quad}$ |
| 9. $85 + 10 = \underline{\quad ? \quad}$ | 10. $85 + 20 = \underline{\quad ? \quad}$ |
| 11. $85 + 31 = \underline{\quad ? \quad}$ | 12. $85 + 42 = \underline{\quad ? \quad}$ |
| 13. $85 - 10 = \underline{\quad ? \quad}$ | 14. $85 - 20 = \underline{\quad ? \quad}$ |
| 15. $85 - 31 = \underline{\quad ? \quad}$ | 16. $85 - 42 = \underline{\quad ? \quad}$ |
| 17. $9 + 8 = \underline{\quad ? \quad}$ | 18. $19 + 8 = \underline{\quad ? \quad}$ |
| 19. $29 + 8 = \underline{\quad ? \quad}$ | 20. $39 + 8 = \underline{\quad ? \quad}$ |
| 21. $6 + 9 = \underline{\quad ? \quad}$ | 22. $16 + 9 = \underline{\quad ? \quad}$ |
| 23. $26 + 9 = \underline{\quad ? \quad}$ | 24. $36 + 9 = \underline{\quad ? \quad}$ |

Estimate the answer.

25. Is $496 + 302$ about 700 or is it about 800?
26. Is $501 + 410$ about 900 or is it about 1000?
27. Is $\$6.98 + \2.00 about $\$8.00$ or is it about $\$9.00$?
28. Is $\$9.03 - \2.95 about $\$7.00$ or is it about $\$6.00$?

Complete each sentence.

29. $\$5.00$ is as much money as 4 dollars and $\underline{\quad ? \quad}$ dimes.
30. $95 = 9$ tens 5 ones, or 8 tens $\underline{\quad ? \quad}$ ones

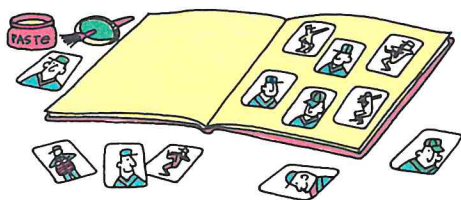
Find the answers and check.

- | | | | |
|---|--|--|--|
| 31. $\begin{array}{r} 126 \\ -85 \\ \hline \end{array}$ | 32. $\begin{array}{r} 278 \\ -59 \\ \hline \end{array}$ | 33. $\begin{array}{r} 387 \\ -138 \\ \hline \end{array}$ | 34. $\begin{array}{r} 499 \\ -428 \\ \hline \end{array}$ |
| 35. $\begin{array}{r} 176 \\ -47 \\ \hline \end{array}$ | 36. $\begin{array}{r} 623 \\ -252 \\ \hline \end{array}$ | 37. $\begin{array}{r} 510 \\ -387 \\ \hline \end{array}$ | 38. $\begin{array}{r} 833 \\ -388 \\ \hline \end{array}$ |

TWO USES OF DIVISION

- A.** Paul has 12 baseball cards.
He pastes 6 on each page.
How many pages can he fill?

- $\underline{\quad} \times 6 = 12$, so $12 \div 6 = \underline{\quad}$
- He can fill $\underline{\quad}$ pages.



- B.** Peter has 12 football cards.
He shares them equally with Paul.
How many cards does each get?

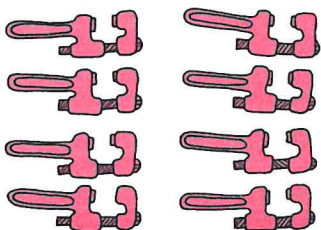
- $2 \times \underline{\quad} = 12$, so $12 \div 2 = \underline{\quad}$
- Each has $\underline{\quad}$ cards.



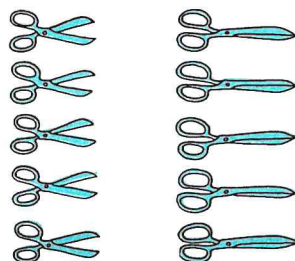
EXERCISES

Ask a question about each picture. Write the division fact that can be used to answer your question.

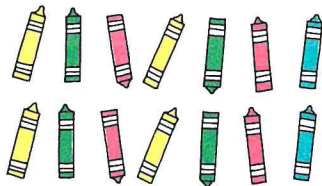
1.



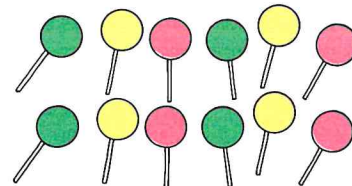
2.



3.

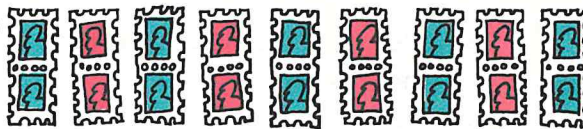


4.

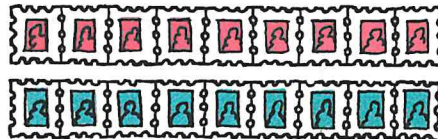


Find the answer.

5. Jerry had 18 stamps. He gave 2 to each of his brothers. He has none left. Jerry has ? brothers.



6. Jerry and one of his brothers share 18 stamps equally. Each will get ? stamps.



7. Jane and Brad shared the candies in the picture equally. How many candies did each get?



8. If 14 boys are separated into 2 teams of the same number, how many boys will there be on each team?



9. How many 2-inch pieces of ribbon can you cut from a foot of ribbon?



10. How many dollars are worth as much as 2 half dollars?
4 half dollars? 6 half dollars?
8 half dollars?



Think Twice

11. Suppose a set can have any number of members from 1 through 20. Write the numbers for each set that can be separated into 2 equivalent subsets.

THE GREATEST NUMBER OF TWOS

A. The shoes are arranged in pairs. Use the picture to help you find the greatest whole number for q . Then find r .

- 4 is 2 twos and a remainder of 0.

$$4 = (q \times 2) + r$$

- 5 is q twos and a remainder of r .

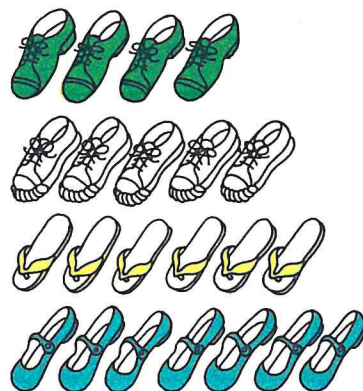
$$5 = (q \times 2) + r$$

- 6 is q twos and a remainder of r .

$$6 = (q \times 2) + r$$

- 7 is q twos and a remainder of r .

$$7 = (q \times 2) + r$$



B. Use multiplication facts you know to find the greatest number of twos in 15.

- Are there at least 5 twos in 15? Are there at least 6 twos in 15? 7 twos in 15? 8 twos in 15?
- Then what is the greatest number for q that will make this sentence true? $q \times 2 < 15$

EXERCISES

Find the greatest whole number of twos and the remainder for each.

*1. 9

2. 13

3. 17

4. 11

5. 4

Write a sentence using the greatest whole number for q .

*6. $q \times 2 < 3$

7. $q \times 2 < 9$

8. $q \times 2 < 7$

9. $q \times 2 < 5$

10. $q \times 2 < 13$

11. $q \times 2 < 15$

12. $q \times 2 < 11$

13. $q \times 2 < 17$

14. $q \times 2 < 19$

15. $q \times 2 < 1$

16. $q \times 2 < 21$

17. $q \times 2 < 10$

* 1. 4 r1 6. $1 \times 2 < 3$

FINDING REMAINDERS

A. To find r in $13 = (q \times 2) + r$,
Tim used the form at the right.

$$2 \overline{)13}$$

$$\begin{array}{r} 6 \\ 2 \overline{)13} \end{array}$$

$$\begin{array}{r} 6 \text{ r} 1 \\ 2 \overline{)13} \end{array}$$

$$6 \times 2 \rightarrow \begin{array}{r} 12 \\ 1 \end{array}$$

- What is the greatest number of 2's in 13?

Where is 6 written?

- 6 twos equal .

Subtract the 6 twos from 13.

$$13 - 12 = \underline{\quad}$$

What is the remainder?

- $13 = (6 \times 2) + \underline{\quad}$

✓ Copy and complete these examples.

$$\begin{array}{r} ? \text{ r} ? \\ 2 \overline{)17} \\ ?? \\ \hline ? \end{array}$$

$$17 = (\underline{\quad} \times 2) + \underline{\quad}$$

$$\begin{array}{r} ? \text{ r} ? \\ 2 \overline{)11} \\ ?? \\ \hline ? \end{array}$$

$$11 = (\underline{\quad} \times 2) + \underline{\quad}$$

EXERCISES

Find the quotient and remainder. Then write a true sentence as you did in the two examples above.

Example: $2 \overline{)7}$ Answer: $\begin{array}{r} 3 \text{ r} 1 \\ 2 \overline{)7} \end{array}$ $7 = (3 \times 2) + 1$

1. $2 \overline{)7}$

2. $2 \overline{)9}$

3. $2 \overline{)15}$

4. $2 \overline{)12}$

5. $2 \overline{)19}$

6. $2 \overline{)10}$

7. $5 \overline{)11}$

8. $5 \overline{)19}$

9. $10 \overline{)74}$

10. $5 \overline{)46}$

11. $2 \overline{)11}$

12. $2 \overline{)17}$

13. $2 \overline{)19}$

14. $2 \overline{)3}$

15. $5 \overline{)38}$

16. $5 \overline{)27}$

17. $5 \overline{)16}$

18. $2 \overline{)1}$

19. $10 \overline{)39}$

20. $5 \overline{)33}$

CHECKPOINT

- ✓ Check your understanding of **key terms and phrases**.

Use each in a sentence.

commutative property of multiplication

product

factor

quotient

remainder

- ✓ Check your understanding of **key ideas**.

1a. Solve.

$$6 \times 8 = 48 \quad 8 \times 6 = \underline{\quad}$$

1b. What is the commutative property of multiplication?

2a. Find the product.

$$3 \times 0 = \underline{\quad} \quad 10 \times 0 = \underline{\quad}$$

2b. The product of any number and zero is always $\underline{\quad}$.

3a. $6 \times 1 = \underline{\quad}$ $10 \times 1 = \underline{\quad}$

$$1 \times 6 = \underline{\quad} \quad 1 \times 10 = \underline{\quad}$$

3b. The product of any number and 1 is always $\underline{\quad}$.

- ✓ Check your **skills**.

Find the product.

$$\begin{array}{r} 1. \quad 2 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 2 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 2 \\ \times 0 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 2 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 2 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 2 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 8 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 3 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 1 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 6 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 5 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 9 \\ \times 2 \\ \hline \end{array}$$

Find the quotient.

$$13. \quad 2 \overline{)18}$$

$$14. \quad 2 \overline{)12}$$

$$15. \quad 2 \overline{)6}$$

$$16. \quad 2 \overline{)4}$$

$$17. \quad 2 \overline{)10}$$

$$18. \quad 2 \overline{)16}$$

$$19. \quad 2 \overline{)2}$$

$$20. \quad 7 \overline{)14}$$

$$21. \quad 4 \overline{)8}$$

$$22. \quad 3 \overline{)6}$$

$$23. \quad 1 \overline{)2}$$

$$24. \quad 5 \overline{)10}$$

Find the quotient and remainder.

$$25. \quad 2 \overline{)17}$$

$$26. \quad 2 \overline{)7}$$

$$27. \quad 2 \overline{)19}$$

$$28. \quad 5 \overline{)13}$$

$$29. \quad 5 \overline{)16}$$

$$30. \quad 10 \overline{)27}$$

UNIT TEST

Find the answers.

1. Which does *not* name the same number as the others?
a. $2 + 2 + 2 + 2$ b. 4×2 c. $8 \div 2$ d. 4 twos
2. Each lamp has two light bulbs.
How many light bulbs do 5 lamps have?
3. Pat and his father share 14 gumdrops equally.
How many gumdrops does Pat get?
4. Balloons cost 2¢ each.
How much will 9 balloons cost?
5. What number makes this sentence true?
 $15 = (\square \times 2) + 1$
6. Write three pairs of numbers that make $\triangle \times \square = \square \times \triangle$ true.

Complete each sentence.

7. $56 \times 1 = \underline{\quad ? \quad}$

8. $42 \times 0 = \underline{\quad ? \quad}$

9. $17 \div 1 = \underline{\quad ? \quad}$

10. $16 \div 2 = \underline{\quad ? \quad}$

If you have time, try these.

Solve.

11. $224 + 417 + n = 760$

12. $\$10.00 - \$4.98 = n$

MATHAMUSEMENTS

Copy this 3-by-3 magic square. Can you complete it so that its magic sum is 45?

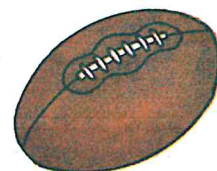
<u>?</u>	14	19
22	15	<u>?</u>
<u>?</u>	16	18

INQUIRY INTO GEOMETRY

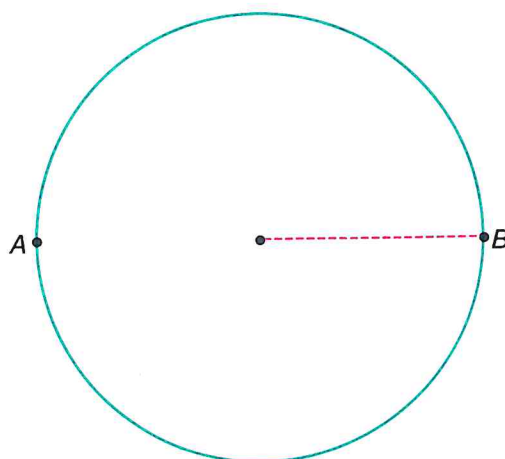
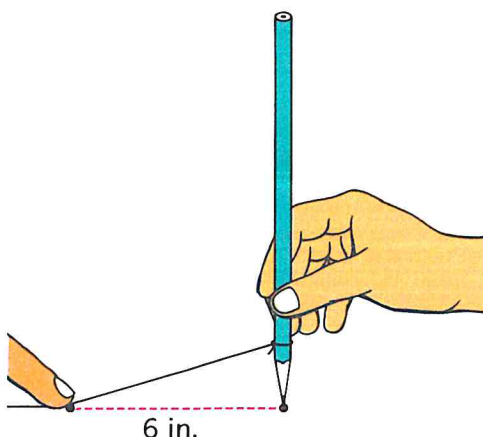
Drawing Circles and Ellipses

You know what a circle looks like.

- Do you know what an ellipse looks like?
- If you drew a picture of a football, Would it look more like a circle or more like an ellipse?
- Do you know how to draw a circle or an ellipse with only a pencil, a piece of string, and some tacks?

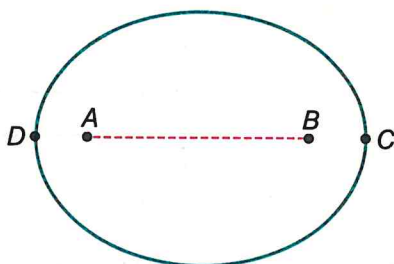
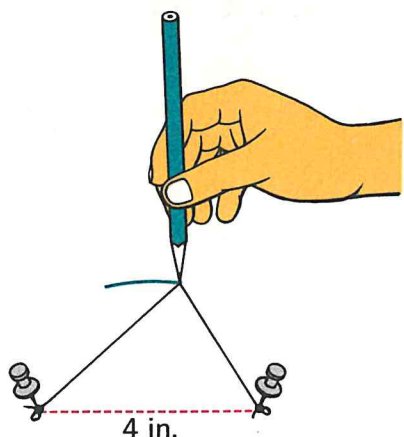


DRAWING A CIRCLE



- Put a tack in a piece of cardboard.
- Take a piece of string about 6 inches long.
- Tie one end of the string to the tack and the other end to your pencil.
- Keep the string tight between the tack and the pencil.
- Move the pencil all the way around the tack.
- Did you draw a circle or an ellipse?

DRAWING AN ELLIPSE



- Put two tacks about 4 inches apart in a piece of cardboard.
- Take a piece of string about 6 inches long.
- Tie the ends of the string to the tacks.
- Place your pencil inside the string.
- Pull the string tight.
- Keeping the string tight, move the pencil all the way around the two tacks.
- What did you draw?

For Further Inquiry

Use the same piece of string and tacks you used to draw the ellipse.

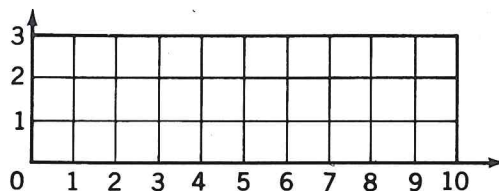
- Move the tacks closer together.
- Draw another ellipse.
- How does the new ellipse differ from the first one you drew?

Suppose you move the tacks farther apart.

- What will this do to the ellipse you drew?
- Draw the ellipse and find out.

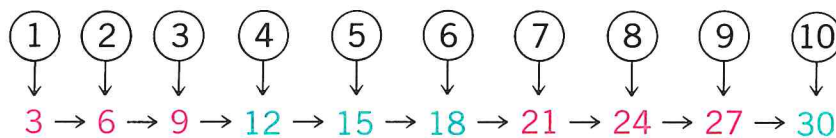
How would you place the tacks to make the ellipse look almost like a circle?

EXPLORING WITH 3 AS A FACTOR



A. Count the squares by threes. Begin: 3, 6, 9, \dots .

B. The circles below show how many threes are counted. Count another way by threes. Begin this way: "One three is three. Two threes is six. Three threes is nine."

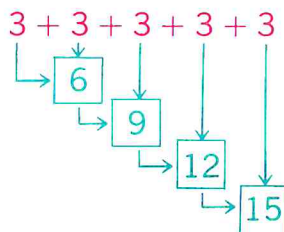


- When you count by 3's, which answers are less than 10?
between 10 and 20? between 20 and 30?
- How many 3's are less than 10?
between 10 and 20? between 20 and 30? exactly 30?

C. Use the diagram to find a .

$$5 \times 3 = a$$

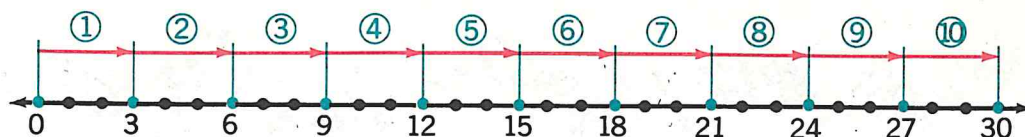
- Since $5 \times 3 = 15$, then
 $6 \times 3 = \underline{\quad ? \quad}$, $7 \times 3 = \underline{\quad ? \quad}$,
and $8 \times 3 = \underline{\quad ? \quad}$.



D. Use the given fact to help you.

- $2 \times 3 = 6$, so $4 \times 3 = \underline{\quad ? \quad}$
- $3 \times 3 = 9$, so $6 \times 3 = \underline{\quad ? \quad}$ and $9 \times 3 = \underline{\quad ? \quad}$
- $10 \times 3 = 30$, so $9 \times 3 = 30 - 3$ or $\underline{\quad ? \quad}$
- $8 \times 3 = 24$, so $7 \times 3 = 24 - 3$ or $\underline{\quad ? \quad}$

EXERCISES



Solve. Use the number line if you need to.

- | | | |
|--|--|--|
| * 1. 2 threes = n
$2 \times 3 = n$ | 2. 3 threes = n
$3 \times 3 = n$ | 3. 4 threes = n
$4 \times 3 = n$ |
| 4. 5 threes = n
$5 \times 3 = n$ | 5. 6 threes = n
$6 \times 3 = n$ | 6. 7 threes = n
$7 \times 3 = n$ |
| 7. 8 threes = n
$8 \times 3 = n$ | 8. 9 threes = n
$9 \times 3 = n$ | 9. 10 threes = n
$10 \times 3 = n$ |
| *10. 3 fives = n
5 threes = n | 11. 3 twos = n
2 threes = n | 12. 3 tens = n
10 threes = n |
| 13. 3 ones = n
1 three = n | *14. $9 = n$ threes
$9 = n \times 3$ | 15. $12 = n$ threes
$12 = n \times 3$ |
| 16. $21 = n$ threes
$21 = n \times 3$ | 17. $27 = n$ threes
$27 = n \times 3$ | 18. $30 = n$ threes
$30 = n \times 3$ |

Write two multiplication and two division sentences for each number family.

- | | | | |
|----------------|----------------|----------------|-----------------|
| *19. {2, 3, 6} | 20. {4, 3, 12} | 21. {5, 3, 15} | 22. {7, 3, 21} |
| 23. {9, 3, 27} | 24. {6, 3, 18} | 25. {8, 3, 24} | 26. {10, 3, 30} |

Think Twice

Copy and complete each set.

27. Multiples of 3. {0, 3, 6, ?, ?, ?, ?, ?, ?, ?, 30}
28. Odd multiples of 3. {3, ?, ?, ?, 27}
29. Even multiples of 3. {0, 6, ?, ?, ?, 30}

* 1. 6; 6 10. 15; 15 14. 3; 3 19. $2 \times 3 = 6$; $3 \times 2 = 6$; $6 \div 2 = 3$; $6 \div 3 = 2$

MULTIPLICATION WITH 3 AS A FACTOR



A. Most club sandwiches use 3 slices of bread. How many slices of bread would you need to make 9 club sandwiches?

- Count by threes until you reach nine threes. Begin: "One three is three. Two threes is six. Three threes is nine."

B. Read the table below. Begin by saying: "Zero times three is zero. One times three is three."

Multiplication facts with 3 as a factor

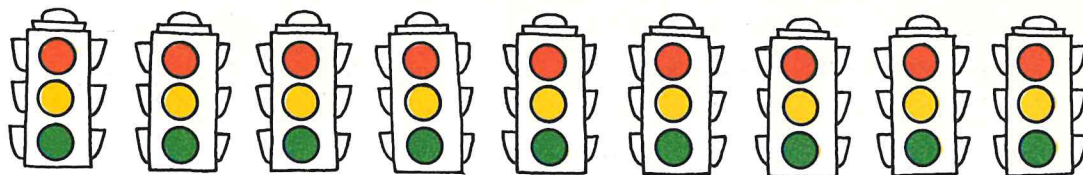
3	3	3	3	3	3	3	3	3	3
$\times 0$	$\times 1$	$\times 2$	$\times 3$	$\times 4$	$\times 5$	$\times 6$	$\times 7$	$\times 8$	$\times 9$
<u>0</u>	<u>3</u>	<u>6</u>	<u>9</u>	<u>12</u>	<u>15</u>	<u>18</u>	<u>21</u>	<u>24</u>	<u>27</u>
0	1	2	3	4	5	6	7	8	9
$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$
<u>0</u>	<u>3</u>	<u>6</u>	<u>9</u>	<u>12</u>	<u>15</u>	<u>18</u>	<u>21</u>	<u>24</u>	<u>27</u>

EXERCISES

Practice until you can write every product correctly.

- | | | | | | |
|---|---|---|--|--|--|
| 1. $\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$ | 2. $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$ | 3. $\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$ | 4. $\begin{array}{r} 0 \\ \times 3 \\ \hline \end{array}$ | 5. $\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$ | 6. $\begin{array}{r} 3 \\ \times 3 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$ | 8. $\begin{array}{r} 3 \\ \times 1 \\ \hline \end{array}$ | 9. $\begin{array}{r} 3 \\ \times 0 \\ \hline \end{array}$ | 10. $\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$ | 11. $\begin{array}{r} 3 \\ \times 7 \\ \hline \end{array}$ | 12. $\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$ |

USING 3 IN MULTIPLICATION



A. There are 3 lights on a traffic signal. How many lights are there on 4 signals?

■ Think: Four 3's is 12. $4 \times 3 = \underline{\quad}$

✓ How many lights are there on 5 signals? 2 signals?
7 signals? 9 signals? 3 signals? 0 signals? 1 signal?

EXERCISES

Complete each sentence.

- *1. Three dollars make ? quarters.
2. Three feet make ? inches.
3. Three hours make ? minutes.
4. Three meters make ? centimeters.

Find the products. Estimate each answer to see if it is sensible.

- | | | | | | |
|---|---|---|---|---|---|
| *5. $\begin{array}{r} 23 \\ \times 3 \\ \hline \end{array}$ | 6. $\begin{array}{r} 30 \\ \times 3 \\ \hline \end{array}$ | 7. $\begin{array}{r} 71 \\ \times 3 \\ \hline \end{array}$ | 8. $\begin{array}{r} 43 \\ \times 3 \\ \hline \end{array}$ | 9. $\begin{array}{r} 90 \\ \times 3 \\ \hline \end{array}$ | 10. $\begin{array}{r} 52 \\ \times 3 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 62 \\ \times 3 \\ \hline \end{array}$ | 12. $\begin{array}{r} 12 \\ \times 3 \\ \hline \end{array}$ | 13. $\begin{array}{r} 63 \\ \times 3 \\ \hline \end{array}$ | 14. $\begin{array}{r} 22 \\ \times 3 \\ \hline \end{array}$ | 15. $\begin{array}{r} 51 \\ \times 3 \\ \hline \end{array}$ | 16. $\begin{array}{r} 42 \\ \times 3 \\ \hline \end{array}$ |
| 17. $\begin{array}{r} 30 \\ \times 3 \\ \hline \end{array}$ | 18. $\begin{array}{r} 31 \\ \times 3 \\ \hline \end{array}$ | 19. $\begin{array}{r} 53 \\ \times 3 \\ \hline \end{array}$ | 20. $\begin{array}{r} 21 \\ \times 3 \\ \hline \end{array}$ | 21. $\begin{array}{r} 52 \\ \times 3 \\ \hline \end{array}$ | 22. $\begin{array}{r} 72 \\ \times 3 \\ \hline \end{array}$ |

* 1. 12 5. 69; Estimate: 60

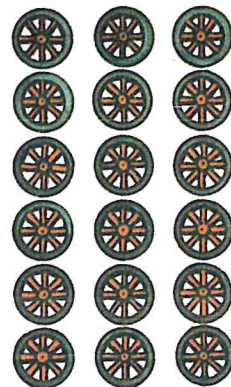
DIVIDING BY 3

Walter and his friends were making three-wheeled carts. They collected 18 wheels. How many carts could they make?

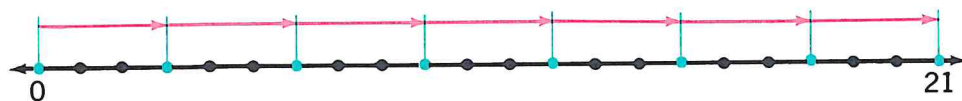


A. To find the number of carts, think:
How many threes make 18?

- Count by threes to 18.
How many threes do you get?
- $\underline{\quad} \text{ threes} = 18$
 $\underline{\quad} \times 3 = 18$
- When you know n for $n \times 3 = 18$,
you also know n for $18 \div 3 = n$.
- Since $6 \times 3 = 18$, then $18 \div 3 = 6$.



B. You can use the number line to help you divide.
Each arrow covers 3 units.



- Count the arrows.

$$\underline{\quad} \times 3 = 21$$

$$21 \div 3 = \underline{\quad}$$

✓ What number makes the sentence true?

$$n \times 3 = 12$$

$$n \times 3 = 15$$

$$12 \div 3 = n$$

$$18 \div 3 = n$$

$$n \times 3 = 24$$

$$n \times 3 = 21$$

$$27 \div 3 = n$$

$$6 \div 3 = n$$

$$n \times 3 = 30$$

$$n \times 3 = 18$$

$$9 \div 3 = n$$

$$3 \div 3 = n$$

EXERCISES

Complete each sentence.

- *1. $3 + 3 = 6$ There are ? 3's in 6. $6 \div 3 = \underline{\quad}$
 2. $2 + 2 + 2 = 6$ There are ? 2's in 6. $6 \div 2 = \underline{\quad}$
 3. $3 + 3 + 3 + 3 = 12$ There are ? 3's in 12. $12 \div 3 = \underline{\quad}$
 4. $4 + 4 + 4 = 12$ There are ? 4's in 12. $12 \div 4 = \underline{\quad}$
 *5. There are ? 3's in 15. $15 \div 3 = \underline{\quad}$
 There are ? 5's in 15. $15 \div 5 = \underline{\quad}$
 6. There are ? 3's in 18. $18 \div 3 = \underline{\quad}$
 There are ? 6's in 18. $18 \div 6 = \underline{\quad}$
 7. There are ? 3's in 27. $27 \div 3 = \underline{\quad}$
 There are ? 9's in 27. $27 \div 9 = \underline{\quad}$
 8. There are ? 3's in 30. $30 \div 3 = \underline{\quad}$
 There are ? 10's in 30. $30 \div 10 = \underline{\quad}$
 *9. ? $\times 3 = 24$, 10. ? $\times 3 = 21$,
 so $24 \div 3 = \underline{\quad}$ so $21 \div 3 = \underline{\quad}$
 11. ? $\times 3 = 9$, 12. ? $\times 3 = 12$,
 so $9 \div 3 = \underline{\quad}$ so $12 \div 3 = \underline{\quad}$

Find n .

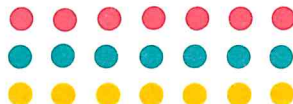
- *13. $n \times 3 = 15$ 14. $3 \times n = 12$ 15. $3 \times n = 18$
 16. $n \times 3 = 6$ 17. $3 \times n = 24$ 18. $n \times 3 = 21$
 19. $n \times 3 = 27$ 20. $3 \times n = 9$ *21. $27 \div 3 = n$
 22. $15 \div 3 = n$ 23. $6 \div 3 = n$ 24. $12 \div 3 = n$
 25. $18 \div 3 = n$ 26. $24 \div 3 = n$ 27. $9 \div 3 = n$

Write four facts for each number family.

28. {7, 3, 21}

$7 \times 3 = \underline{\quad}$ $21 \div 7 = \underline{\quad}$

$3 \times 7 = \underline{\quad}$ $21 \div 3 = \underline{\quad}$



29. {8, 3, 24}

30. {6, 3, 18}

31. {9, 3, 27}

DIVISION FACTS WITH 3 AS A FACTOR

A. Read the table below. Begin by saying: "How many threes equal three? One. How many threes equal six? Two."

Division facts with 3 as a factor								
1	2	3	4	5	6	7	8	9
$3 \overline{)3}$	$3 \overline{)6}$	$3 \overline{)9}$	$3 \overline{)12}$	$3 \overline{)15}$	$3 \overline{)18}$	$3 \overline{)21}$	$3 \overline{)24}$	$3 \overline{)27}$
3	3	3	3	3	3	3	3	3
$1 \overline{)3}$	$2 \overline{)6}$	$3 \overline{)9}$	$4 \overline{)12}$	$5 \overline{)15}$	$6 \overline{)18}$	$7 \overline{)21}$	$8 \overline{)24}$	$9 \overline{)27}$

B. Now read the facts another way. Begin: "Three divided by three equals one. Six divided by three equals two."

EXERCISES

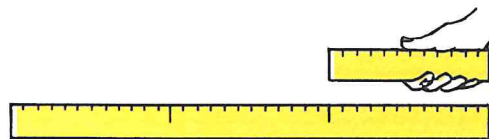
Practice until you can write every answer correctly.

1. $3 \overline{)3}$
2. $5 \overline{)15}$
3. $3 \overline{)6}$
4. $3 \overline{)21}$
5. $3 \overline{)9}$
6. $7 \overline{)21}$
7. $3 \overline{)12}$
8. $3 \overline{)27}$
9. $1 \overline{)3}$
10. $3 \overline{)18}$
11. $8 \overline{)24}$
12. $4 \overline{)12}$
13. $3 \overline{)24}$
14. $9 \overline{)27}$
15. $2 \overline{)6}$
16. $6 \overline{)18}$
17. $3 \overline{)15}$
18. $3 \overline{)21}$

Solve.

- *19. $3 \times n = 18$
20. $n \times 3 = 27$
- *21. $n \times 4 = 12$
22. $7 \times n = 21$
23. $3 \times n = 15$
24. $2 \times n = 6$
25. $3 \times n = 24$
26. $n \times 3 = 3$
27. $3 \times n = 9$

28. How many yards make 3 ft.?
 6 ft.? 9 ft.? 24 ft.? 12 ft.?
 27 ft.? 15 ft.? 18 ft.?



* 19. 6 21. 3

THE GREATEST NUMBER OF THREES

A. Use the chart to help you find the greatest number for q . Then find r .

- 6 is 2 threes and a remainder of 0.

$$6 = (q \times 3) + r$$

- 7 is q threes and a remainder of 1.

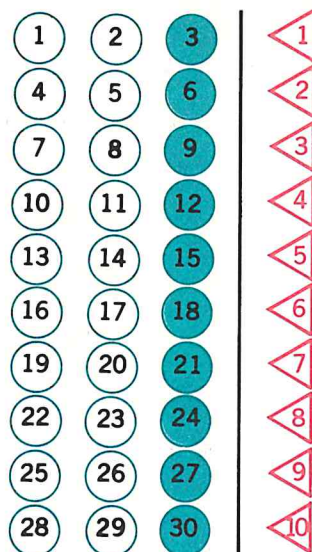
$$7 = (q \times 3) + r$$

- 8 is q threes and a remainder of r .

$$8 = (q \times 3) + r$$

- 9 is q threes and a remainder of r .

$$9 = (q \times 3) + r$$



B. Multiply to find the greatest number of 3's in 19. $q \times 3 < 19$

- Are there at least 4 threes in 19? Are there at least 5 threes in 19? 6 threes in 19? 7 threes in 19?
- 6 is the greatest number of threes in 19. $6 \times 3 < 19$ is true.

EXERCISES

Find the greatest number that makes the sentence true.

- | | | |
|-----------------------|-----------------------|-----------------------|
| *1. $q \times 3 < 16$ | 2. $q \times 3 < 5$ | 3. $q \times 3 < 29$ |
| 4. $q \times 3 < 8$ | 5. $q \times 3 < 19$ | 6. $q \times 3 < 2$ |
| 7. $q \times 3 < 22$ | 8. $q \times 3 < 13$ | 9. $q \times 3 < 11$ |
| 10. $q \times 3 < 10$ | 11. $q \times 3 < 25$ | 12. $q \times 3 < 7$ |
| 13. $q \times 3 < 23$ | 14. $q \times 3 < 4$ | 15. $q \times 3 < 20$ |

Find the quotient and remainder.

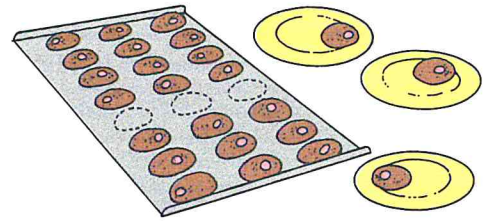
- | | | | | |
|-------------------------|------------------------|------------------------|------------------------|------------------------|
| *16. $3 \overline{)13}$ | 17. $3 \overline{)20}$ | 18. $3 \overline{)14}$ | 19. $3 \overline{)5}$ | 20. $3 \overline{)8}$ |
| 21. $3 \overline{)28}$ | 22. $3 \overline{)4}$ | 23. $3 \overline{)25}$ | 24. $3 \overline{)26}$ | 25. $3 \overline{)17}$ |

* 1. $5 \times 3 < 16$ 16. 4 r1

TWO USES OF DIVISION

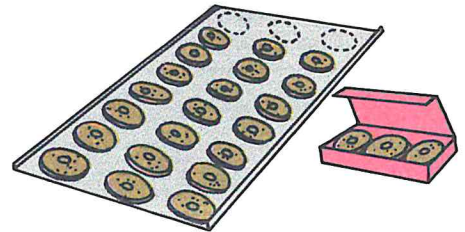
- A.** Mother baked 24 cookies.
Her 3 children wanted to
share them equally. How
many did each child get?

- $3 \times \underline{\quad} = 24$, so $24 \div 3 = \underline{\quad}$
- Each child got $\underline{\quad}$ cookies.



- B.** Mother baked 24 cookies.
She wants to put 3 cookies
in each box. How many
boxes can she fill?

- $\underline{\quad} \times 3 = 24$, so $24 \div 3 = \underline{\quad}$.
- She can fill $\underline{\quad}$ boxes.



EXERCISES

Find the answer. Write a number sentence if it helps you.

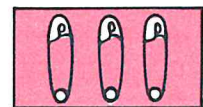
1. Mother made 9 paper dolls.
Her 3 daughters shared them
equally. How many did each
daughter get?



2. Father had 21¢. He gave 7¢
to each of his sons. How
many sons did he have?



3. Safety pins come 3 on a card.
How many cards are needed
for 15 pins?



Solve each problem.

4. How many 3-legged stools can be made from 27 legs?



5. You have an equal number of cupcakes in 3 boxes. You have 18 cupcakes. How many are in each box?



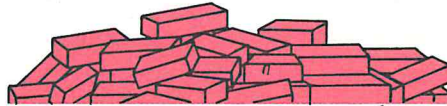
6. There are 24 cards. There are 3 children playing. Each gets the same number of cards. How many cards does each child get?



7. Each player must have 3 cards. There are 18 cards. How many children can play?



8. Tom had 27 bricks to carry to the truck. He carried 3 at a time. How many trips did he make?



9. There are 12 cookies. You put them equally into 3 lunch boxes. How many do you put in each box?



10. There are 3 relay teams. There are 21 children. Each team has the same number of children. How many are on each team?



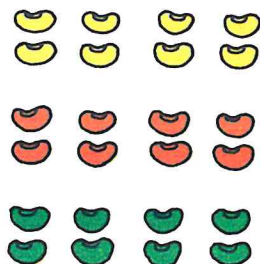
11. There are 3 mixing bowls in a set. How many sets can you make from 6 mixing bowls?



ASSOCIATIVE PROPERTY OF MULTIPLICATION

A. The arrangement of beans shows a product in two ways.

- How does it show 2 fours?
How is $3 \times (2 \text{ fours})$ shown?
- How does it show 3 twos?
How is $(3 \text{ twos}) \times 4$ shown?
- How do $3 \times (2 \times 4)$
and $(3 \times 2) \times 4$ compare?



B. The arrangement of coins shows a product in two ways.

- How does it show 2 tens?
How is $3 \times (2 \text{ tens})$ shown?
- How does it show 3 twos?
How is $(3 \text{ twos}) \times 10$ shown?
- How do $3 \times (2 \times 10)$ and
 $(3 \times 2) \times 10$ compare?



C. Give the simplest name for each. Compare your answers.

$$\begin{array}{|l} (2 \times 3) \times 1 \\ 2 \times (3 \times 1) \end{array}$$

$$\begin{array}{|l} (4 \times 0) \times 3 \\ 4 \times (0 \times 3) \end{array}$$

$$\begin{array}{|l} (5 \times 2) \times 2 \\ 5 \times (2 \times 2) \end{array}$$

When you find the product of three factors, the product is the same whether you start by grouping the first two factors or the last two factors.

For all whole numbers a , b , and c ,
 $(a \times b) \times c = a \times (b \times c)$ is true.

This is the **associative property of multiplication**.

✓ Group the first two factors.

$$(3 \times 2) \times 1 = \underline{\quad ? \quad}$$

Group the last two factors.

$$3 \times (2 \times 1) = \underline{\quad ? \quad}$$

EXERCISES

Copy and complete. Do not compute.

*1. $(18 \times 20) \times 63 = 18 \times (20 \times \underline{\quad})$

2. $(12 \times 5) \times 39 = 12 \times (\underline{\quad} \times 39)$

Replace \bullet with $<$, $=$, or $>$.

*3. $(2 \times 3) \times 1 \bullet 2 \times (3 \times 1)$

4. $(4 \times 3) \times 2 \bullet 4 \times (3 \times 5)$

5. $4 \times (2 \times 10) \bullet (4 \times 2) \times 10$

6. $8 \times (3 \times 10) \bullet (8 \times 3) \times 9$

To find 4×20 , you can think: $\longrightarrow 4 \times (2 \text{ tens})$

What is the simplest $(4 \times 2) \text{ tens}$

name for 4×20 ? $8 \text{ tens} = 80$

Use this method to find these products.

7. $(3 \times 2) \text{ tens} = \underline{\quad} \text{ tens}$

$3 \times (2 \text{ tens}) = \underline{\quad} \text{ tens}$

$3 \times 20 = \underline{\quad}$

9. $(3 \times 5) \text{ tens} = \underline{\quad} \text{ tens}$

$3 \times (5 \text{ tens}) = \underline{\quad} \text{ tens}$

$3 \times 50 = \underline{\quad}$

11. $(2 \times 3) \text{ hundreds} = \underline{\quad}$

$2 \times (3 \text{ hundreds}) = \underline{\quad}$

$2 \times 300 = \underline{\quad}$

8. $(2 \times 4) \text{ tens} = \underline{\quad} \text{ tens}$

$2 \times (4 \text{ tens}) = \underline{\quad} \text{ tens}$

$2 \times 40 = \underline{\quad}$

10. $(6 \times 7) \text{ tens} = \underline{\quad} \text{ tens}$

$6 \times (7 \text{ tens}) = \underline{\quad} \text{ tens}$

$6 \times 70 = \underline{\quad}$

12. $(4 \times 2) \text{ hundreds} = \underline{\quad}$

$4 \times (2 \text{ hundreds}) = \underline{\quad}$

$4 \times 200 = \underline{\quad}$

Find the product.

*13. $5 \times 20 = n$

14. $2 \times 50 = n$

15. $6 \times 20 = n$

16. $2 \times 60 = n$

17. $4 \times 50 = n$

18. $5 \times 40 = n$

19. $5 \times 200 = n$

20. $4 \times 100 = n$

21. $9 \times 200 = n$

22. $\begin{array}{r} 90 \\ \times 5 \\ \hline \end{array}$

23. $\begin{array}{r} 50 \\ \times 9 \\ \hline \end{array}$

24. $\begin{array}{r} 50 \\ \times 8 \\ \hline \end{array}$

25. $\begin{array}{r} 80 \\ \times 2 \\ \hline \end{array}$

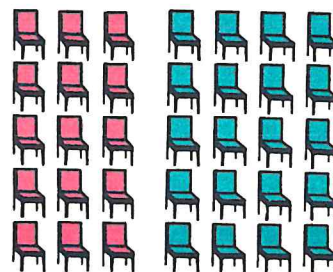
26. $\begin{array}{r} 20 \\ \times 8 \\ \hline \end{array}$

*1. $(18 \times 20) \times 63 = 18 \times (20 \times 63)$ 3. = 13. 100

DISTRIBUTIVE PROPERTY OF MULTIPLICATION

A. The picture shows a product in two ways.

- How does it show 5×7 chairs?
How is $5 \times (3 + 4)$ chairs shown?
- How does it show (5×3) chairs?
How does it show (5×4) chairs?
How is $(5 \times 3) + (5 \times 4)$ chairs shown?
- How do $5 \times (3 + 4)$ and $(5 \times 3) + (5 \times 4)$ compare?



B. Use this set to name the product in the three ways given.

- 4×5
 $4 \times (2 + 3)$
 $(4 \times 2) + (4 \times 3)$
- Does $4 \times (2 + 3)$ name the same number as $(4 \times 2) + (4 \times 3)$?



C. Use this set to name the product in the three ways given.

- 6×3
 $(4 + 2) \times 3$
 $(4 \times 3) + (2 \times 3)$
- Why is this sentence true? $(4 + 2) \times 3 = (4 \times 3) + (2 \times 3)$



To find the product of a number and two addends, you can add and then multiply or multiply and then add.

For all whole numbers a , b , and c ,
 $a \times (b + c) = (a \times b) + (a \times c)$.

This is the

distributive property of multiplication over addition.

✓ Add and then multiply.

$$3 \times (2 + 1) = \underline{\quad ? \quad}$$

Multiply and then add.

$$(3 \times 2) + (3 \times 1) = \underline{\quad ? \quad}$$

EXERCISES

Complete each sum.

*1. $6 = (2 + \underline{\quad})$

2. $8 = (3 + \underline{\quad})$

3. $9 = (\underline{\quad} + 7)$

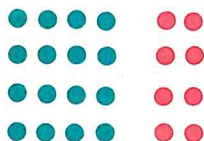
4. $12 = (\underline{\quad} + 2)$

5. $24 = (20 + \underline{\quad})$

6. $33 = (\underline{\quad} + 3)$

Use the distributive property to name the number of members in each set in three ways as in B.

7.

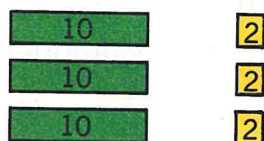


$4 \times \underline{\quad} = \square$

$4 \times (\underline{\quad} + \underline{\quad}) = \square$

$(4 \times \underline{\quad}) + (4 \times \underline{\quad}) = \square$

8.

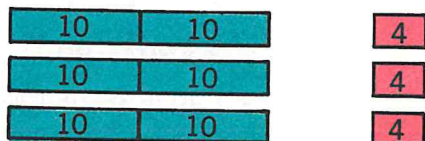


$3 \times \underline{\quad} = n$

$3 \times (\underline{\quad} + \underline{\quad}) = \square$

$(3 \times \underline{\quad}) + (3 \times \underline{\quad}) = \square$

*9.

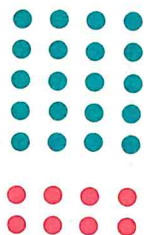


10.



Use the distributive property to name the number of members in each set in three ways as in C.

11.



$\underline{\quad} \times 4 = \square$

$(\underline{\quad} + \underline{\quad}) \times 4 = \square$

$(\underline{\quad} \times 4) + (\underline{\quad} \times 4) = \square$

12.



$\underline{\quad} \times 5 = \square$

$(\underline{\quad} + \underline{\quad}) \times 5 = \square$

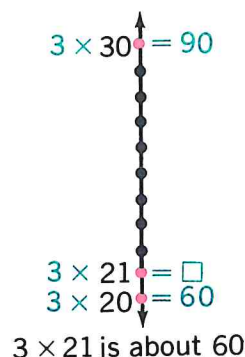
$(\underline{\quad} \times 5) + (\underline{\quad} \times 5) = \square$

* 1. 4 9. 3×24 ; $3 \times (20 + 4)$; $(3 \times 20) + (3 \times 4)$

ESTIMATING PRODUCTS

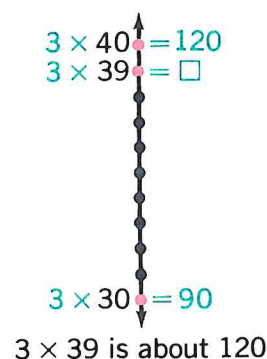
- A.** Mark was asked to estimate the product for $3 \times 21 = \square$. Why did he choose 3×20 and 3×30 as possible answers?

- Why is 60 a better choice than 90?
- Estimate this product.
 $4 \times 31 = \square$



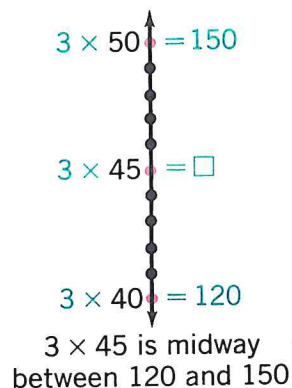
- B.** Mary was asked to estimate the product for $3 \times 39 = \square$. Why did she choose 3×30 and 3×40 as possible answers?

- She estimated the product as 120. Why?
- Estimate this product.
 $4 \times 29 = \square$



- C.** Mike was asked to estimate the product for $3 \times 45 = \square$. Why did Mike say the product is midway between 120 and 150?

- Estimate this product.
 $4 \times 35 = \square$



EXERCISES

Write only the answer.

*1. $10 \times 5 = n$

2. $60 \times 2 = n$

3. $3 \times 30 = n$

4. $1 \times 80 = n$

5. $5 \times 40 = n$

6. $3 \times 40 = n$

* 1. 50

Replace ● with < or >. Do not compute.

* 7. 3×24 ● 3×20

9. 2×19 ● 2×20

11. 2×35 ● 2×40

8. 5×41 ● 5×40

10. 2×35 ● 2×30

12. 2×52 ● 2×50

13. 5×76 ● 5×80

15. 5×88 ● 5×90

17. 5×64 ● 5×50

14. 5×61 ● 5×50

16. 2×45 ● 2×50

18. 5×93 ● 5×90

19. 2×29 ● 2×30

21. 3×48 ● 3×50

23. 5×32 ● 5×30

20. 5×23 ● 5×20

22. 2×71 ● 2×70

24. 3×85 ● 3×90

Choose the best estimate from the set given.

* 25. $3 \times 52 = \square$ {120, 150, 180}

27. $5 \times 12 = \square$ {50, 75, 100}

29. $2 \times 67 = \square$ {100, 120, 140}

31. $5 \times 81 = \square$ {400, 480, 500}

33. $4 \times 25 = \square$ {80, 100, 120}

35. $2 \times 75 = \square$ {140, 150, 160}

26. $2 \times 88 = \square$ {150, 180, 200}

28. $2 \times 45 = \square$ {80, 90, 100}

30. $7 \times 31 = \square$ {210, 250, 280}

32. $5 \times 92 = \square$ {400, 450, 500}

34. $2 \times 74 = \square$ {100, 140, 150}

36. $3 \times 38 = \square$ {90, 100, 120}

Estimate the product.

37. 3×52

38. 2×64

39. 3×73

40. 3×48

41. 2×26

42. 3×35

Think Twice

What digits are missing?

43.
$$\begin{array}{r} 4? \\ \times 2 \\ \hline 80 \end{array}$$

44.
$$\begin{array}{r} ?0 \\ \times 5 \\ \hline 150 \end{array}$$

45.
$$\begin{array}{r} 20 \\ \times ? \\ \hline 140 \end{array}$$

46.
$$\begin{array}{r} ?? \\ \times 8 \\ \hline 160 \end{array}$$

USING THE DISTRIBUTIVE PROPERTY



A. Shown above are 3 sets of 25 crayons.

- 3 sets of 25 is the same as 3 sets of 20 + 5. $3 \times 25 = 3 \times (20 + 5)$
- It is also the same as 3 sets of 20 and 3 sets of 5. $3 \times 25 = (3 \times 20) + (3 \times 5)$
- How do you find 60 and 15? $3 \times 25 = 60 + 15$
- Find the simplest name for 3×25 . $3 \times 25 = \underline{\quad ? \quad}$

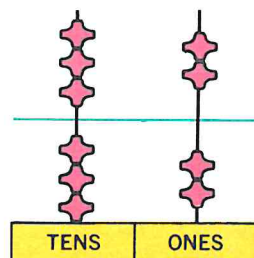
B. The chart shows 4 sets of 12.

- Does it show 4 sets of $10 + 2$ also?
- Where does it show 4 sets of 10?
Where does it show 4 sets of 2?
- $4 \times 12 = (4 \times 10) + (4 \times 2)$
 $= \underline{\quad ? \quad} + \underline{\quad ? \quad}$
 $= \underline{\quad ? \quad}$

TENS	ONES
/	//
/	//
/	//
/	//

C. What does the abacus show?

- $2 \times 32 = (2 \times 30) + (2 \times 2)$
 $= \underline{\quad ? \quad} + \underline{\quad ? \quad}$
 $= \underline{\quad ? \quad}$



EXERCISES

Study these tens-ones charts. Then answer each question.

1. How many times does the chart show 5 tens 4 ones?

$$54 = 50 + 4$$

$$\begin{aligned} 5 \times (50 + 4) &= (5 \times \underline{\quad}) + (5 \times 4) \\ &= \underline{\quad} + 20 \\ &= \underline{\quad} \end{aligned}$$

TENS	ONES
////	////
////	////
////	////
////	////
////	////

2. What does this chart show?

$$25 = \underline{\quad} + 5$$

$$\begin{aligned} 6 \times (20 + 5) &= (6 \times \underline{\quad}) + (6 \times \underline{\quad}) \\ &= \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

TENS	ONES
//	////
//	////
//	////
//	////
//	////
//	////

Copy and complete these sentences.

$$\begin{aligned} 3. \quad 2 \times 14 &= (2 \times \underline{\quad}) + (2 \times 4) \\ &= \underline{\quad} + 8 \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 4. \quad 3 \times 22 &= (3 \times \underline{\quad}) + (3 \times 2) \\ &= \underline{\quad} + 6 \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 5. \quad 2 \times 43 &= (2 \times \underline{\quad}) + (2 \times 3) \\ &= \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 6. \quad 4 \times 52 &= (4 \times \underline{\quad}) + (4 \times \underline{\quad}) \\ &= \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 7. \quad 5 \times 80 &= 400 + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 8. \quad 7 \times 21 &= 140 + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 9. \quad 4 \times 51 &= \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

Find the answer.

*10. $4 \times 13 = n$

11. $2 \times 16 = n$

12. $3 \times 22 = n$

13. $2 \times 27 = n$

14. $3 \times 41 = n$

15. $5 \times 56 = n$

*16. $\begin{array}{r} 73 \\ \times 3 \\ \hline \end{array}$

17. $\begin{array}{r} 49 \\ \times 5 \\ \hline \end{array}$

18. $\begin{array}{r} 90 \\ \times 4 \\ \hline \end{array}$

19. $\begin{array}{r} 28 \\ \times 5 \\ \hline \end{array}$

20. $\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array}$

21. $\begin{array}{r} 65 \\ \times 3 \\ \hline \end{array}$

MULTIPLICATION OF ONES AND TENS

A. Estimate the product of 3 and 12.

- Is 12 nearer to 10 or to 20?
- Is 3×12 nearer to 30 or to 60?

B. Here are two ways to find the product of 3 and 12.

$$\begin{aligned} 3 \times 12 &= (3 \times 10) + (3 \times 2) \\ &= 30 + 6 \\ &= 36 \end{aligned}$$

$$\begin{array}{r} 12 \\ \times 3 \\ \hline 3 \times 2 \longrightarrow 6 \\ 3 \times 10 \longrightarrow 30 \\ \hline 3 \times 12 \longrightarrow 36 \end{array}$$

- In each way, where do you show 2 ones multiplied by 3?
- Where do you show 1 ten multiplied by 3?
- Where do you show the addition of the products?

EXERCISES

Copy and complete by writing the missing digits.

1.
$$\begin{array}{r} 22 \\ \times 4 \\ \hline 4 \times 2 \longrightarrow ? \\ 4 \times 20 \longrightarrow 80 \\ \hline 4 \times 22 \longrightarrow 88 \end{array}$$

2.
$$\begin{array}{r} 43 \\ \times 2 \\ \hline 2 \times 3 \longrightarrow ? \\ 2 \times 40 \longrightarrow ?? \\ \hline 2 \times 43 \longrightarrow ?? \end{array}$$

3.
$$\begin{array}{r} 81 \\ \times 5 \\ \hline 5 \times 1 \longrightarrow ? \\ 5 \times 80 \longrightarrow 400 \\ \hline 5 \times 81 \longrightarrow ??? \end{array}$$

4.
$$\begin{array}{r} 13 \\ \times 3 \\ \hline 9 \\ ?? \\ \hline ?? \end{array}$$

5.
$$\begin{array}{r} 14 \\ \times 2 \\ \hline ? \\ 20 \\ \hline ?? \end{array}$$

6.
$$\begin{array}{r} 61 \\ \times 5 \\ \hline ? \\ ??? \\ \hline 305 \end{array}$$

7.
$$\begin{array}{r} 73 \\ \times 2 \\ \hline ? \\ ??? \\ \hline ??? \end{array}$$

Estimate. Then copy and find the products.

Check your answers with your estimates.

*8. 91
 $\times 5$

9. 70
 $\times 5$

10. 27
 $\times 1$

11. 12
 $\times 4$

12. 92
 $\times 2$

13. 83
 $\times 2$

14. 54
 $\times 2$

15. 63
 $\times 2$

16. 11
 $\times 3$

17. 73
 $\times 2$

18. 50
 $\times 6$

19. 64
 $\times 2$

20. 74
 $\times 2$

21. 52
 $\times 8$

22. 34
 $\times 2$

23. 81
 $\times 2$

24. 21
 $\times 5$

25. 72
 $\times 2$

26. 33
 $\times 2$

27. 43
 $\times 2$

28. 24
 $\times 2$

29. 11
 $\times 4$

30. 12
 $\times 3$

31. 20
 $\times 4$

Solve.

*32. $4 \times 22 = n$

33. $11 \times 7 = n$

34. $7 \times 51 = n$

35. $2 \times 30 = n$

36. $6 \times 51 = n$

37. $9 \times 21 = n$

38. $2 \times 84 = n$

39. $11 \times 9 = n$

40. $2 \times 53 = n$

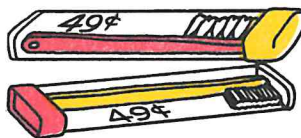
41. $2 \times 94 = n$

42. $8 \times 21 = n$

43. $6 \times 20 = n$

Find the answer.

- *44. Find the cost of two
49-cent toothbrushes.



45. Jack delivered 3 orders of
groceries. Each customer
gave him a 25¢ tip. How
much money is that?

46. Kelly bought 3 hot dogs at
a roadstand. Each cost 20¢.
How much did he pay?



* 8. Estimate: 450; Product: 455

32. 88

44. 98¢

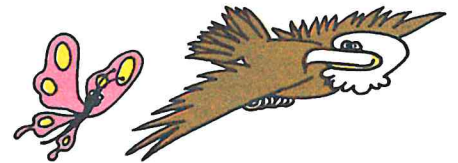
PROBLEMS TO SOLVE

Find the answer.

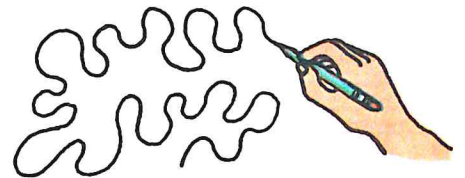
1. A flea can jump as far as 13 inches. A frog can jump 7 times as far as a flea. How far can a frog jump?



2. A butterfly can fly as fast as 20 miles an hour. A golden eagle can fly 6 times as fast as a butterfly. How fast can a golden eagle fly?



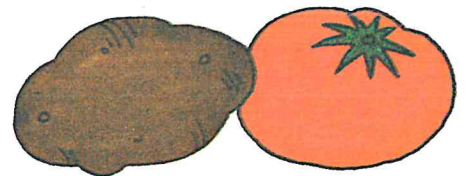
3. A mark 38 miles long can be drawn with an ordinary lead pencil. If you wanted to, how long a mark could you draw with 5 pencils?



4. The smallest dog is a Chihuahua. It can weigh as little as 1 pound. The largest dog is a St. Bernard. It can weigh as much as 256 times as much as a Chihuahua. How much can a St. Bernard weigh?

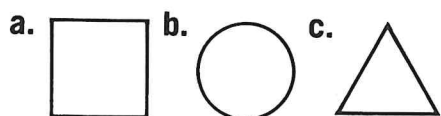


5. A tomato has 50 calories. A potato has 4 times as many calories as a tomato. How many calories are there in a potato?



KEEPING UP IN MATHEMATICS

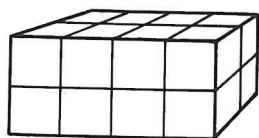
Match the picture with its name. [86]



1. Circle. 2. Triangle.
3. Square.

How many unit regions are needed to cover the sides? [90-91]

4. 3 sides
5. 6 sides



Write a fraction to show the red part of each unit. [92-93]



Find the quotient. [188-89]

8. $2 \overline{)14}$ 9. $2 \overline{)4}$ 10. $2 \overline{)16}$
11. $2 \overline{)2}$ 12. $5 \overline{)10}$ 13. $3 \overline{)6}$
14. $4 \overline{)8}$ 15. $6 \overline{)12}$ 16. $9 \overline{)18}$

Find the quotient and remainder. [160-61, 193]

17. $2 \overline{)15}$ 18. $2 \overline{)7}$
19. $2 \overline{)11}$ 20. $5 \overline{)9}$
21. $5 \overline{)23}$ 22. $5 \overline{)36}$
23. $10 \overline{)73}$ 24. $10 \overline{)87}$

Complete each table. [55-63, 82]

25.	n	$n + 7$	26.	n	$n + 8$
	0	7		4	12
	5	12		8	16
	9	16		2	10
	3	$\frac{?}{?}$		6	$\frac{?}{?}$
	7	$\frac{?}{?}$		1	$\frac{?}{?}$
	2	$\frac{?}{?}$		5	$\frac{?}{?}$
	6	$\frac{?}{?}$		3	$\frac{?}{?}$
	1	$\frac{?}{?}$		7	$\frac{?}{?}$
	4	$\frac{?}{?}$		9	$\frac{?}{?}$
	8	$\frac{?}{?}$		0	$\frac{?}{?}$

27.	n	$n + 9$	28.	n	$n \times 2$
	3	12		6	12
	1	10		2	4
	5	14		7	14
	2	$\frac{?}{?}$		4	$\frac{?}{?}$
	6	$\frac{?}{?}$		9	$\frac{?}{?}$
	8	$\frac{?}{?}$		0	$\frac{?}{?}$
	7	$\frac{?}{?}$		8	$\frac{?}{?}$
	0	$\frac{?}{?}$		5	$\frac{?}{?}$
	4	$\frac{?}{?}$		3	$\frac{?}{?}$

CHECKPOINT

✓ Check your understanding of **key phrases**.

Use each in a sentence.

associative property of multiplication

distributive property of multiplication over addition

✓ Check your understanding of **key ideas**.

1a. Since $(18 \times 22) \times 34 = 396$,
then $18 \times (22 \times 34) = \underline{\quad ? \quad}$.

1b. What is the associative
property of multiplication?

2a. Since $13 \times (45 + 26) = 923$,
then $(13 \times 45) + (13 \times 26) = \underline{\quad ? \quad}$.

2b. What is the distributive
property of multiplication
over addition?

3a. Choose the best estimate
from the given set.

$$3 \times 27 = \square \{60, 90\}$$

$$3 \times 82 = \square \{240, 270\}$$

3b. Tell how to estimate a
product.

✓ Check your **skills**.

Find the product.

$$\begin{array}{r} 1. \quad 1 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 7 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 3 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 3 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 3 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 6 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 46 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 67 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 59 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 28 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 32 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 81 \\ \times 2 \\ \hline \end{array}$$

Find the quotient.

$$13. \quad 6 \overline{)18}$$

$$14. \quad 9 \overline{)27}$$

$$15. \quad 3 \overline{)15}$$

$$16. \quad 3 \overline{)21}$$

$$17. \quad 3 \overline{)9}$$

$$18. \quad 3 \overline{)12}$$

$$19. \quad 8 \overline{)24}$$

$$20. \quad 7 \overline{)21}$$

$$21. \quad 5 \overline{)15}$$

$$22. \quad 4 \overline{)12}$$

UNIT TEST

Find the answers.

1. Write two multiplication sentences and two division sentences for this number family. $\{3, 6, 18\}$
2. There are 3 buttons on a card.
How many buttons are there on 7 cards?
3. You have 16¢. What is the greatest number of 3-cent cards you can buy?
4. What is the greatest number that makes this sentence true?
 $n \times 3 < 25$
5. What number makes this sentence true?
 $7 \times (5 \times 3) = (7 \times 5) \times \Delta$
6. Is 2×36 less than, equal to, or greater than $(2 \times 30) + (2 \times 6)$?

Find the products.

$$\begin{array}{r} 7. \ 62 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \ 51 \\ \times 5 \\ \hline \end{array}$$

Find the quotients and remainders.

$$9. \ 3 \overline{)10}$$

$$10. \ 3 \overline{)24}$$

If you have time, try these.

11. $3 \times 65 = 195$, so $195 \div 3 = \underline{\quad}$

12. $2 \times 54 = 108$, so $4 \times 54 = \underline{\quad}$

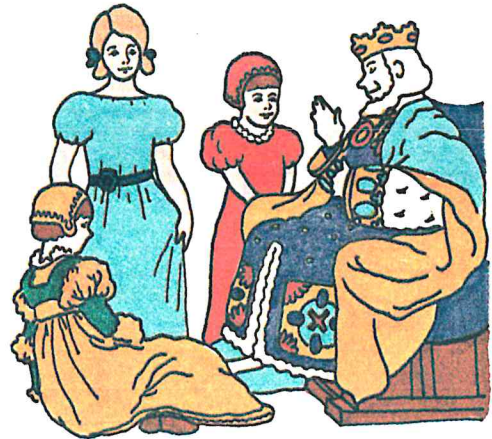
MATHAMUSEMENTS

Can you write 6 three-place numerals with the digits 1, 2, and 3?
Do not use the same digit twice in any numeral.

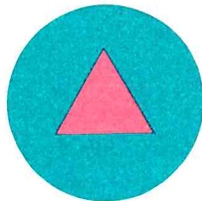
INQUIRY INTO NUMBER

Money in Globonia

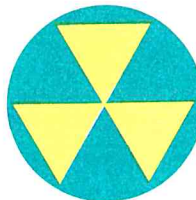
In the faraway land of Globonia, there lived a king who had three very beautiful daughters. For this reason, the money of Globonia was based on three.



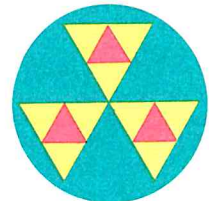
- The globenny was their coin of smallest value.
- A globnic was worth 3 globennies.
- A globona was worth 3 globnics or 9 globennies.
- Two globonas have the same value as ? globnics.
- Two globnics have the same value as ? globennies.
- Two globonas have the same value as ? globennies.



GLOBENNY



GLOBNIC



GLOBONA

- Two globnics and 3 globennies have the same value as how many globennies?
- Two globnics and 3 globennies have the same value as how many globnics?
- Two globnics and 3 globennies have the same value as how many globonas?

People in Globonia used only three digits, 0, 1, and 2, to name amounts of money. The chart shows how they used the digits. What digits are missing from the chart?

COINS	GLOBNICS	GLOBENNIES
One globenny		1
Two globennies		2
Three globennies, or one globnic	1	0
One globnic, one globenny	1	1
One globnic, two globennies	1	?
Two globnics	2	0
Two globnics, one globenny	?	1

In Globonia the numeral 10 is read “one zero.” It means 1 globnic and 0 globennies. The numeral 12 is read “one-two.” It means 1 globnic and 2 globennies.

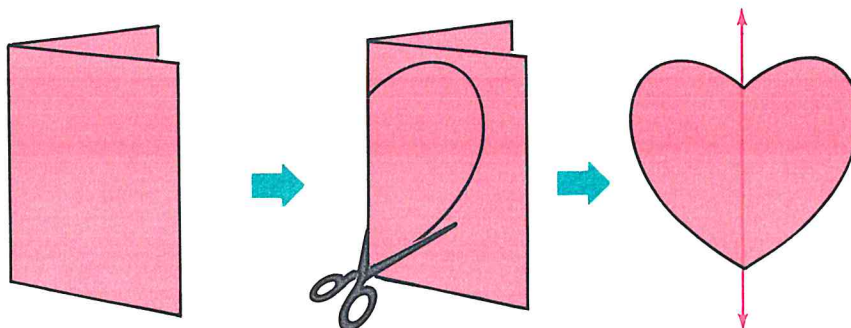
- The numeral 21 means ? globnics and ? globenny.
- The numeral 20 means ? globnics and ? globennies.
- The numeral 11 means ? globnic and ? globenny.
- The numeral 22 means ? globnics and ? globennies.
- Two globnics and 3 globennies have the same value as ? globnics.
- What numeral in Globonia shows 3 globnics?

Suppose you lived in Globonia. You would use globonas, globnics, and globennies to buy things.

- Candy canes cost two globennies each.
How many could you buy with two globonas?
- Apples cost one globnic and one globenny each.
How many could you buy for one globona?
How much change would you get in Globonia money?

LINE SYMMETRY

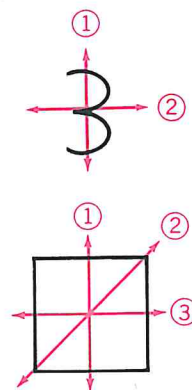
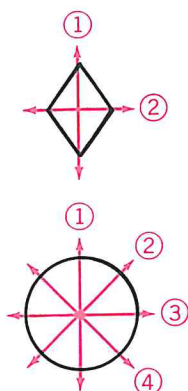
A. Mary is making cutouts of figures that have **line symmetry**.



- Fold a sheet of paper.
- Cut out any figure.
- Unfold the cutout.
- The figure of the heart has line symmetry. The line along the fold is a **line of symmetry**.

B. Here is how you can tell if a figure has line symmetry.

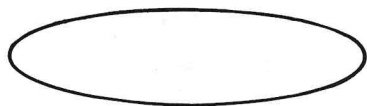
- *Fold a cutout of the figure along a line. If the two parts of the figure match exactly, the figure has line symmetry.*
- Each part is a **reflection** of the other.
The line is a line of symmetry.
- Which red lines are lines of symmetry for the figure?



EXERCISES

Trace each figure. Then draw at least one line of symmetry.

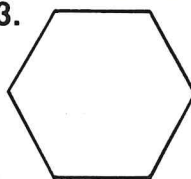
1.



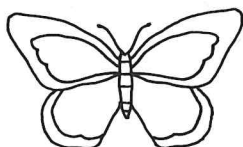
2.



3.



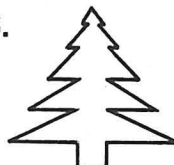
4.



5.

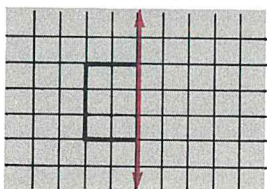


6.

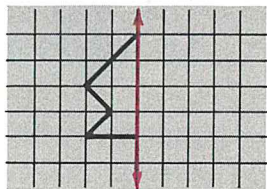


Trace each figure. Then draw the other side so that the red line is a line of symmetry.

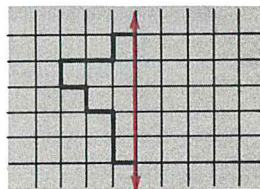
7.



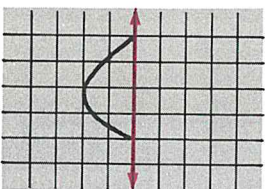
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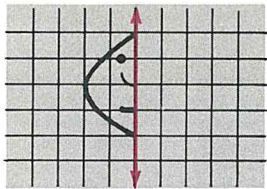
9.



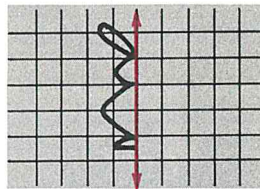
10.



11.



12.



Keeping Up with the Facts

$$\begin{array}{r} 1. \quad 3 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 0 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 4 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 1 \\ \times 1 \\ \hline \end{array}$$

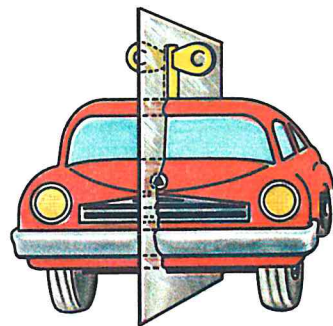
$$\begin{array}{r} 5. \quad 8 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 6 \\ \times 3 \\ \hline \end{array}$$

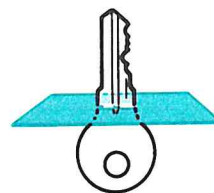
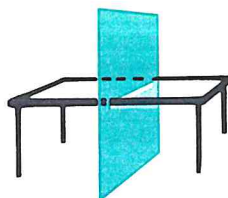
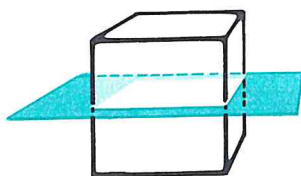
PLANE SYMMETRY

A. Think of a plane separating the toy car into two parts.

- Are the parts exactly alike?
Is each a reflection of the other?
- The toy car has **plane symmetry**.
Think of the plane as a mirror on both sides. If each side of the car is a reflection of the other, the figure has plane symmetry.



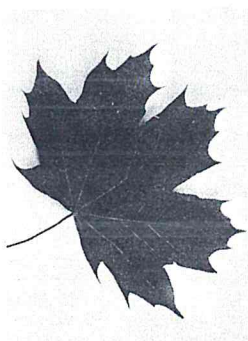
✓ Which figures have plane symmetry?



EXERCISES

Does each figure have at least one plane of symmetry?
Write Yes or No.

*1.



2.



3.



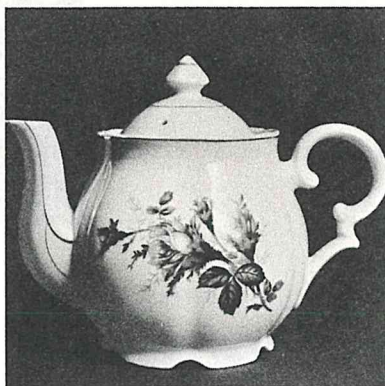
* 1. Yes.

Does each figure have more than one plane of symmetry?
Write Yes or No.

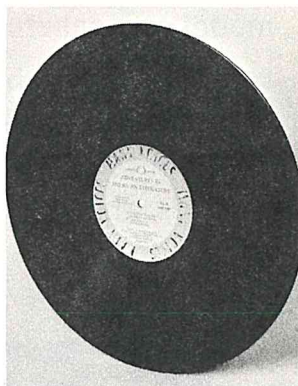
*4.



5.



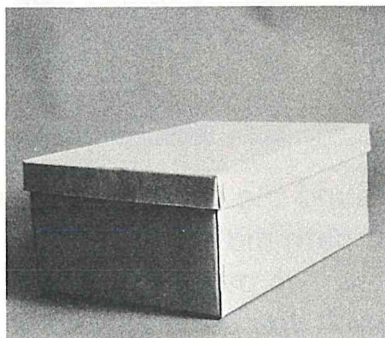
6.



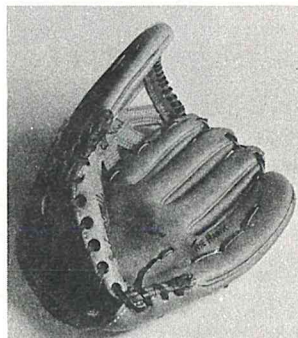
7.



8.



9.



Keeping Up with the Facts

$$\begin{array}{r} 1. \quad 4 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 9 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 8 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 2 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 0 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 7 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 4 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 6 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 1 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 6 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 5 \\ \times 1 \\ \hline \end{array}$$

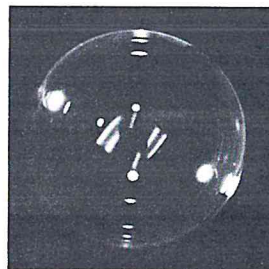
$$\begin{array}{r} 12. \quad 4 \\ \times 0 \\ \hline \end{array}$$

* 4. Yes.

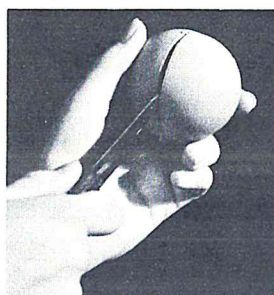
THE SPHERE

A. A soap bubble is a model of a **sphere**.

- Name some other models of a sphere.
- Tell in your own words what a sphere is.

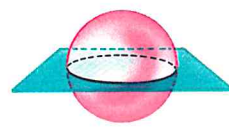
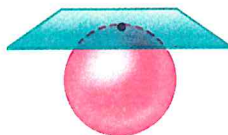
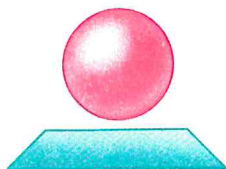


B. A hollow ball is a model of a sphere.



- Trace your finger around the cut edge of each part of the sphere. What closed path did you trace?
- Think of putting these two parts together with a piece of paper between them. If you trace around the sphere with a pencil, what closed path will you draw on the paper?

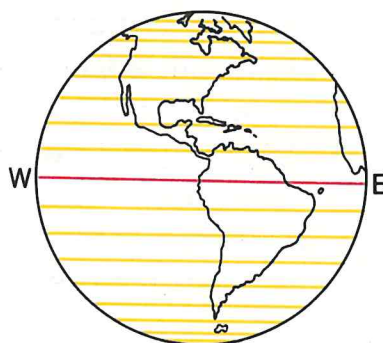
C. A plane and a sphere can intersect in no points at all, in one point, or in a circle.



- Which picture shows a plane that passes through no points in the sphere? one point in the sphere? a set of points that form a circle?

EXERCISES

- *1. With your finger, trace one blue circle from the North Pole to the South Pole and back to the North Pole. How many planes pass through all of this circle?
2. Trace another circle that passes through the North and South Poles. How many planes contain all of this circle?
3. Now think of the two planes from Ex. 1 and 2. Two points on the sphere are in both planes. What are they?
4. Are all the blue circles congruent?
5. Trace the red circle with your finger. How many planes pass through all of this circle?
6. Trace one of the yellow circles with your finger. How many planes pass through all of this circle?
7. Now think of the circles from Ex. 5 and Ex. 6. Are they congruent?
8. One of these circles is congruent to the blue circles. Which one?



Think Twice

9. How many planes of symmetry does a sphere have?
10. Think of all the planes of symmetry for a sphere. How many points are in all the planes?

Keeping Up with the Facts

$$\begin{array}{r} 1. \quad 8 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 9 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 6 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 1 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 1 \\ \times 0 \\ \hline \end{array}$$

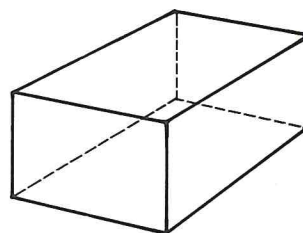
$$\begin{array}{r} 6. \quad 7 \\ \times 5 \\ \hline \end{array}$$

* 1. One.

THE RECTANGULAR CLOSED SURFACE

- A.** A box is a model of a **rectangular closed surface**. It is made of rectangular regions called **faces**.

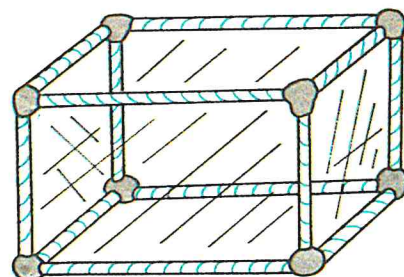
■ How many faces does this box have?



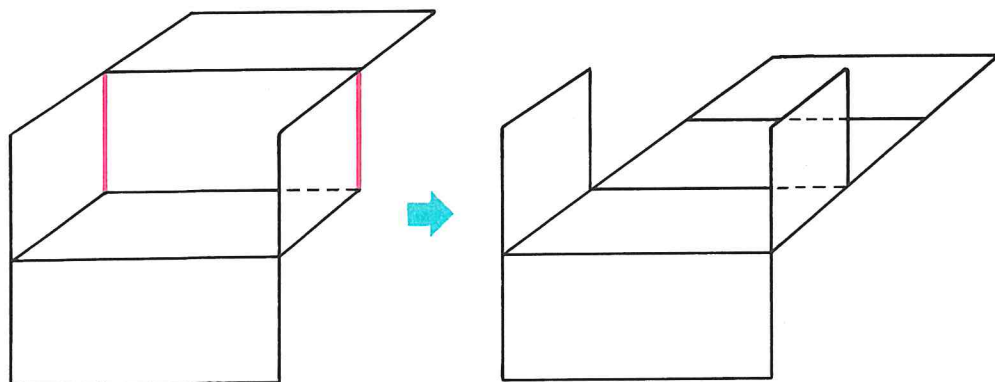
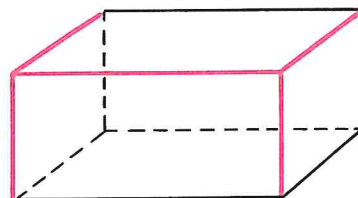
- B.** Neal made a rectangular surface using clay corners, straw edges, and plastic faces.

■ How many straws did he use?
How many edges does the rectangular closed surface have?

■ How many balls of clay did he use?
How many corners does the rectangular closed surface have?

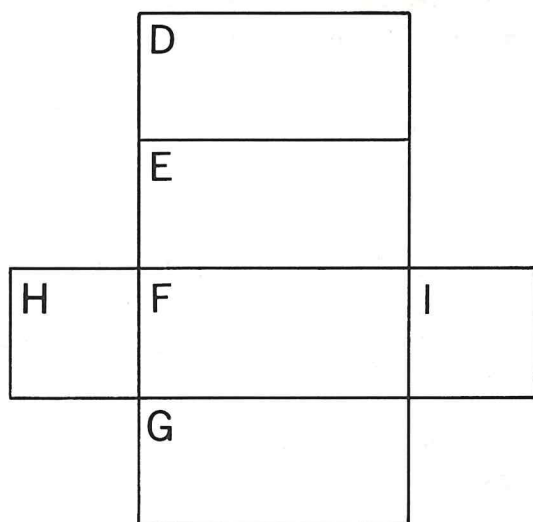


- C.** Jody cut a paper box along the red lines. She unfolded it to see what it looked like.



D. This is the way the box looked when Jody finished.

- How can you fold it to make a box again?



EXERCISES

Use the flat model shown in **D** to answer the following.

- *1. Which faces are congruent to D? to I?

Use the models shown in **A** and **B** to answer each of the following.

2. Each corner is in more than one rectangular region. In how many regions is each corner?
3. Each edge is in more than one region. In how many regions is each edge?

Think Twice

Use the flat model in **C**. Name the face of the box that is its

4. front.
5. bottom.
6. top.
7. back.
8. left side.
9. How many planes of symmetry does a rectangular closed surface have?

* 1. E, F, and G; H

ASK THE QUESTION

The information is given. The number sentence to answer the question is given. You are to ask a question.

A. A hamburger costs 30¢.

A soda costs 20¢.

$$30 + 20 = n$$

- Which question does the number sentence help you answer?
 - a. The hamburger costs how much more than the soda?
 - b. How much do a hamburger and a soda cost together?

B. Kathy is 52 inches tall.

Peter is 58 inches tall.

$$58 - 52 = n$$

- You can ask: How much taller is Peter than Kathy?
What other questions can be asked?

C. John wants to buy a record that costs 90¢. He has 52¢.

$$90 - 52 = n$$

$$52 + n = 90$$

- You can ask: How much more money does John need?
Do both number sentences help answer this question?

EXERCISES

Ask a question that can be answered using the number sentence.

1. Jean had 88¢.

She spent 45¢.

$$88 - 45 = n$$

2. Milk costs 23¢ a pint.

$$23 + 23 = n$$

3. A candy bar costs 15¢.

An ice cream bar costs 20¢.

$$15 + 20 = n$$

4. Vic has 25 marbles.

Malcolm has 32 marbles.

$$32 - 25 = n$$

At the store, Clark saw these toys.
Ask a question about the
toys for each number sentence.

5. $49 + 15 + 10 + 5 = n$
6. $n = 49 + 15 + 5$
7. $25 - 15 = n$
8. $25 + n = 49$
9. $n = 15 - 10$



Make up a problem that can be answered using each of the following
number sentences. Then find the answer.

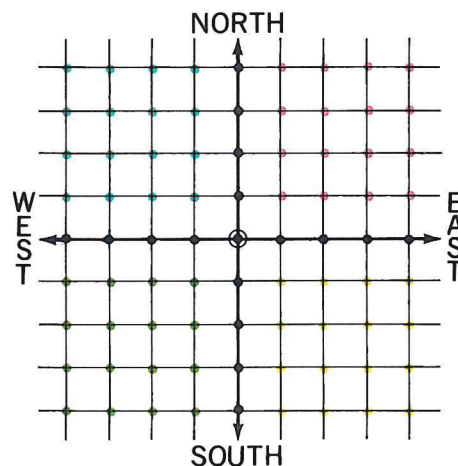
- | | | |
|--------------------|--------------------|-------------------|
| 10. $8 + n = 17$ | 11. $12 - 5 = n$ | 12. $46 + 17 = n$ |
| 13. $25 + 86 = n$ | 14. $52 - 49 = n$ | 15. $83 - 58 = n$ |
| 16. $25 + n = 43$ | 17. $29 + 67 = n$ | 18. $28 + n = 75$ |
| 19. $156 - 69 = n$ | 20. $139 - 76 = n$ | 21. $78 + n = 85$ |

For each problem below, read the information given, and ask a
question using the information. Then write a number sentence
that can be used to answer the question.

22. There are 57 boys and 52 girls on the playground.
23. Josie baked 85 cookies. She gave 37 of them to the family
next door.
24. Ruby's allowance is 25¢ a week. Her older sister gets 75¢ a week.
25. Today is November 10. My birthday is November 16.
26. At the market, apples cost 10¢ each. Bill bought 3 of them.
27. Brenda wanted to spend \$1.00 for her mother's birthday present.
She had 39¢.
28. Lynn went to the store with 93¢. She spent 47¢.
29. The camp bus was driven 97 miles in the morning and 69 miles
in the afternoon.
30. A sandwich costs 35¢ and a lemonade costs 25¢.

LOCATIONS ON A MAP

Maps use a North-South line and an East-West line to help people find locations.



A. Think of the dots as locations. Start at the center dot, \odot , each time. Then follow the direction given below. At what color dot do you stop?

- Go East 3 units, then go North 2 units.
- Go West 3 units, then go North 2 units.
- Go East 3 units, then go South 2 units.
- Go West 3 units, then go South 2 units.

B. “West 2” means “Go West 2 units.”
 “North 3” means “Go North 3 units.”
 Start at the center. At what color dot do you stop?

- | | |
|-----------------------------|-----------------------------|
| ■ East 4, and then North 2. | ■ East 4, and then South 1. |
| ■ West 2, and then North 3. | ■ West 2, and then South 4. |

C. (West 2, North 3) means “Go West 2, and then go North 3.”
 Start at the center. At what color dot do you stop?

- | | |
|---------------------|---------------------|
| ■ (East 4, North 2) | ■ (East 3, South 1) |
| ■ (East 1, North 2) | ■ (East 3, South 4) |
| ■ (West 3, North 4) | ■ (West 2, South 1) |
| ■ (West 4, North 1) | ■ (West 1, South 3) |

✓ Where do you always begin before making your first move? On which line do you go on the first move? on the second move?

EXERCISES

Use the map in A. At what color dot do you stop?

- * 1. Go East 2, then go North 4.
2. Go West 3, then go North 2.
3. Go East 4, then go South 3.
4. Go West 1, then go South 1.
5. East 3, and then North 1.
6. West 4, and then South 2.
7. (East 1, North 1)
8. (East 2, South 4)
9. (West 2, North 3)
10. (West 3, South 3)

Complete each sentence.

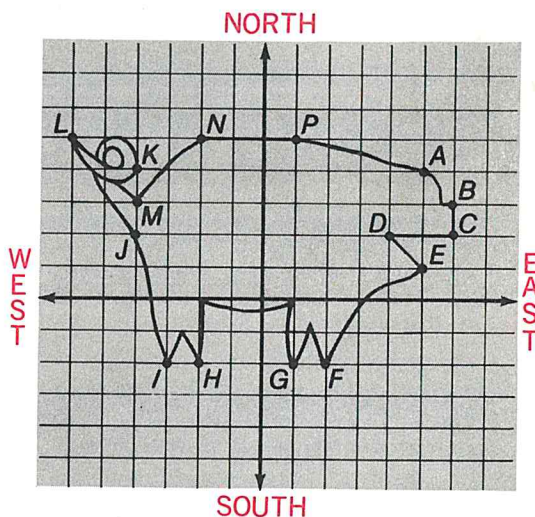
- *11. To get to any red dot, you must go East and then ?.
12. To get to any green dot, you must go West and then ?.
13. To get to any yellow dot, you must go ? and then ?.
14. To get to any blue dot, you must go ? and then ?.

Give the direction and the number of units you move to locate each dot.

Example: A

Answer: (East 5, North 4)

15. B
16. C
17. E
18. G
19. I
20. K
21. M
22. D
23. F
24. H
25. J
26. L
27. N
28. P



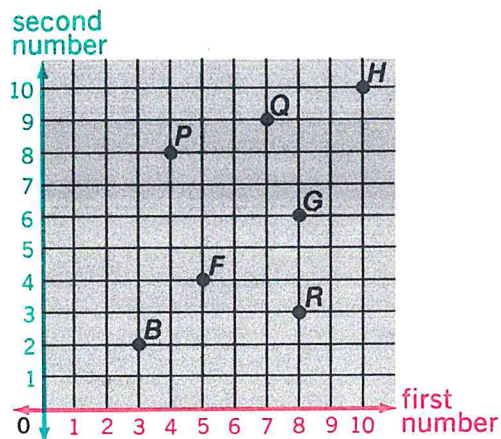
* 1. Red. 11. North.

POINTS FOR NUMBER PAIRS

Finding points in a plane is like finding locations on a map.

A. Begin at 0, where the two number lines intersect.

- Move along the line with red numerals. Are you moving to the right or up?
- Move along the line with blue numerals. Are you moving to the right or up?



B. Use the plane in **A**. Begin at 0. Move right 3 units, then up 2 units. You are at point *B*.

- At what point are you if you begin at 0 and move right 5 units, then move up 4 units? move right 8 units, then up 6 units? move right 10 units, then up 10 units?

To locate any point, you must always begin at 0.

Move a number of units to the right first.

Then move up a number of units.

✓ Give directions to point *Q*.

C. A short way to give directions to a point is to use a pair of numbers in a certain order.

- What point is shown by the pair (8, 3)?
- Give the number pair for point *B*; *F*; *G*; *H*; *P*; *Q*.

Ordered Pair
(8, 3)
↑ ↑
Units Right Units Up

EXERCISES

What number is missing for each number pair?

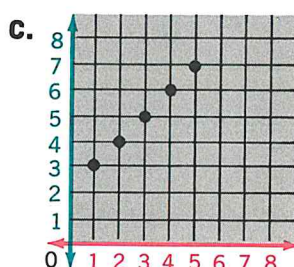
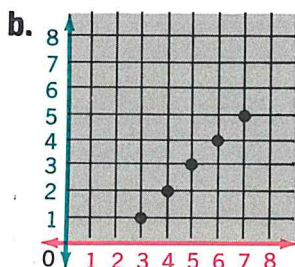
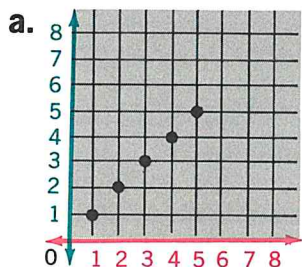
- *1. A (5, ?) 2. B (?, 4)
 3. C (?, 2) 4. D (8, ?)
 5. E (?, 3) 6. F (4, ?)

Name the point each number pair locates.

- *7. (1, 9) 8. (10, 9)
 9. (9, 10) 10. (5, 5)

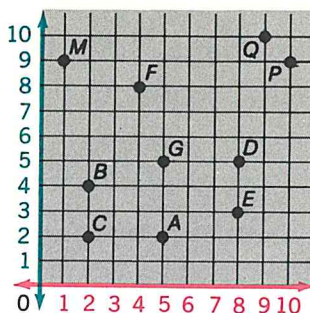
Find a picture below to match each list of number pairs.

- | | | |
|------------|------------|------------|
| 11. (1, 1) | 12. (1, 3) | 13. (3, 1) |
| (2, 2) | (2, 4) | (4, 2) |
| (3, 3) | (3, 5) | (5, 3) |
| (4, 4) | (4, 6) | (6, 4) |
| (5, 5) | (5, 7) | (7, 5) |



Think Twice

14. Where are points for these number pairs: (0, 0), (0, 1), (0, 2), (0, 3), (0, 4)?
15. Where are points for these number pairs: (0, 0), (1, 0), (2, 0), (3, 0), (4, 0)?



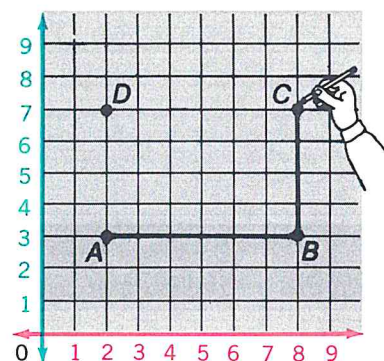
PICTURES ON A GRID

A. Carter has located points for these number pairs.

A (2, 3) B (8, 3)

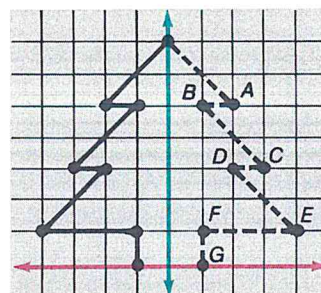
C (8, 7) D (2, 7)

- What geometric figure will Carter have when he connects the points in order from A to B to C to D and back to A?



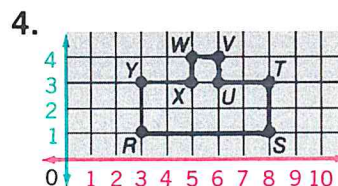
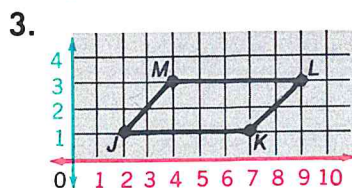
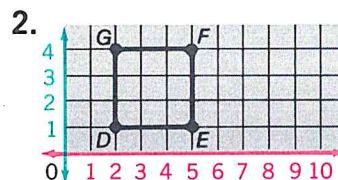
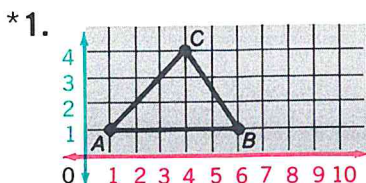
B. Carter is making a figure with line symmetry.

- He started with the points on the left. How did he locate the points on the right?
- The number pair for point A is (2, 5). What is the number pair for point B? C? D? E? F? G?



EXERCISES

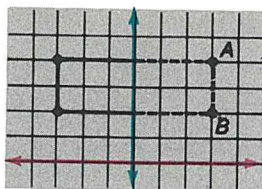
Give the number pair for each point named with a letter.



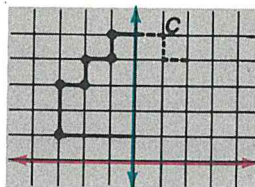
* 1. A (1, 1), B (6, 1), C (4, 4)

Trace each figure. Draw the other side to make the blue line a line of symmetry. Give the number pair for each corner you drew.

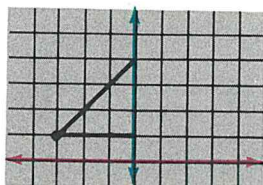
* 5.



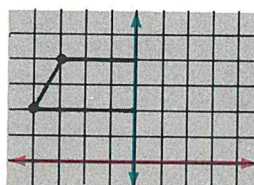
6.



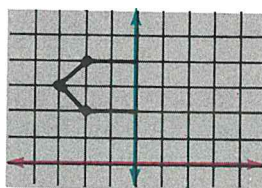
7.



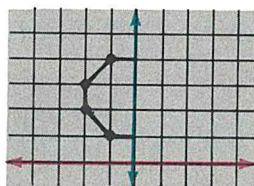
8.



9.



10.



Locate a point for each number pair. Connect the points in order. Then connect the first point to the last point.

11. A (1, 3)

12. A (2, 3)

13. A (1, 2)

14. A (2, 2)

B (5, 3)

B (8, 3)

B (6, 3)

B (4, 2)

C (5, 10)

C (6, 7)

C (6, 5)

C (4, 4)

D (1, 10)

D (1, 4)

D (2, 4)

Keeping Up with the Facts

1. $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$

2. $\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$

3. $\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$

4. $\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$

5. $\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$

6. $\begin{array}{r} 0 \\ \times 2 \\ \hline \end{array}$

* 5. (3, 4), (3, 2)

KEEPING UP IN MATHEMATICS

Solve. [135-36]

1. 4 tens = n ,
so $4 \times 10 = n$.
2. 7 tens = n ,
so $7 \times 10 = n$.
3. $2 \times 3 = 6$,
so 2×3 tens = n .
4. $3 \times 5 = 15$,
so 3×5 tens = n .
5. 7×2 tens = n tens
 (7×2) tens = n tens
 $7 \times 20 = \underline{\quad}$
6. 5×9 tens = n tens
 (5×9) tens = n tens
 $5 \times 90 = \underline{\quad}$

Find the answer. [26-27]

7. $8 = (6 + \underline{\quad})$
8. $89 = (\underline{\quad} + 9)$
9. $92 = (90 + \underline{\quad})$

Use the facts you know to complete each of the following.

[70-71]

10. $6 \times 7 = \square$
 $6 \times (2 + \underline{\quad}) = \square$
 $(6 \times \underline{\quad}) + (\underline{\quad} \times 5) = \square$
 $\underline{\quad} + \underline{\quad} = \square$
11. $4 \times 8 = \square$
 $(3 + \underline{\quad}) \times 8 = \square$
 $(\underline{\quad} \times 8) + (1 \times \underline{\quad}) = \square$
 $\underline{\quad} + \underline{\quad} = \square$

Give an approximation to the nearest ten for each number.

[37]

- | | |
|--------|--------|
| 12. 63 | 13. 81 |
| 14. 67 | 15. 92 |
| 16. 28 | 17. 15 |

Estimate each product. [212-13]

- | | |
|-------------------|-------------------|
| 18. 2×24 | 19. 3×36 |
| 20. 5×49 | 21. 2×81 |

Give an approximation to the nearest hundred for each. [37]

- | | |
|---------|---------|
| 22. 734 | 23. 286 |
| 24. 978 | 25. 652 |
| 26. 461 | 27. 509 |

Rename each as tens and ones.

[68-69]

- | | |
|-------------|-------------|
| 28. 16 ones | 29. 39 ones |
| 30. 95 ones | 31. 50 ones |

Rename each as hundreds and tens. [210-11]

- | | |
|-------------|-------------|
| 32. 28 tens | 33. 42 tens |
| 34. 64 tens | 35. 79 tens |

Find the answer. [202-04]

- | | |
|------------------------|------------------------|
| 36. $3 \overline{)6}$ | 37. $3 \overline{)18}$ |
| 38. $3 \overline{)24}$ | 39. $3 \overline{)14}$ |
| 40. $3 \overline{)26}$ | 41. $3 \overline{)19}$ |

REVIEW AND PRACTICE

Find n .

- | | | |
|----------------------------|----------------------------|----------------------------|
| 1. $(3 + 2) + 4 = n$ | 2. $(8 + 5) + 5 = n$ | 3. $(9 + 2) + 3 = n$ |
| 4. $(4 + 8) + 6 = n$ | 5. $(1 + 6) + 9 = n$ | 6. $(7 + 3) + 8 = n$ |
| 7. $(5 + 7) + 2 = n$ | 8. $(6 + 6) + 1 = n$ | 9. $(2 + 4) + 7 = n$ |
| 10. $(1 + 5) + 4 = n$ | 11. $(8 + 7) + 3 = n$ | 12. $(3 + 8) + 5 = n$ |
| 13. $(6 \times 2) + 1 = n$ | 14. $(3 \times 3) + 1 = n$ | 15. $(5 \times 1) + 1 = n$ |
| 16. $(4 \times 5) + 3 = n$ | 17. $(4 \times 2) + 3 = n$ | 18. $(6 \times 3) + 2 = n$ |
| 19. $(2 \times 5) + 1 = n$ | 20. $(8 \times 5) + 4 = n$ | 21. $(7 \times 5) + 3 = n$ |
| 22. $(5 \times 2) + 2 = n$ | 23. $(7 \times 3) + 3 = n$ | 24. $(3 \times 2) + 2 = n$ |
| 25. $(9 \times 2) + 1 = n$ | 26. $(6 \times 5) + 1 = n$ | 27. $(3 \times 1) + 2 = n$ |
| 28. $(8 \times 3) + 4 = n$ | 29. $(7 \times 2) + 3 = n$ | 30. $(5 \times 5) + 2 = n$ |
| 31. $(2 \times 1) + 1 = n$ | 32. $(2 \times 3) + 1 = n$ | 33. $(8 \times 2) + 4 = n$ |
| 34. $(4 \times 3) + 3 = n$ | 35. $(9 \times 3) + 2 = n$ | 36. $(9 \times 5) + 1 = n$ |
| 37. $(3 \times 5) + 2 = n$ | 38. $(2 \times 2) + 1 = n$ | 39. $(5 \times 3) + 1 = n$ |

Find the product. Then add 2 to your answer.

- | | | |
|--------------------|--------------------|--------------------|
| 40. (5×1) | 41. (3×7) | 42. (5×9) |
| 43. (4×2) | 44. (6×2) | 45. (5×6) |

Find the product. Then add 3 to your answer.

- | | | |
|--------------------|--------------------|--------------------|
| 46. (5×4) | 47. (8×2) | 48. (4×3) |
| 49. (7×2) | 50. (6×3) | 51. (5×6) |

Find the product. Then add 4 to your answer.

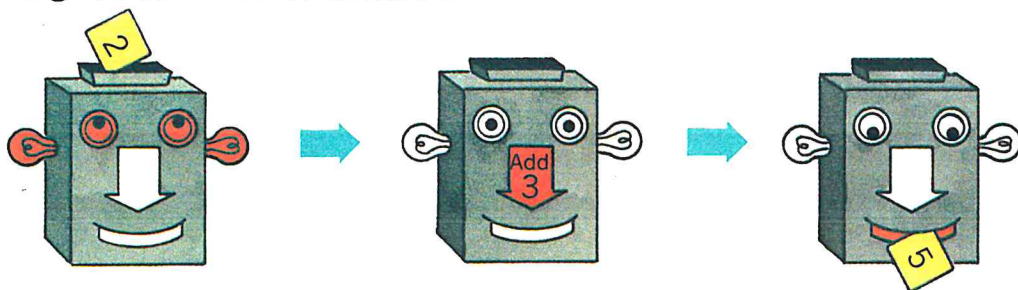
- | | | |
|--------------------|--------------------|--------------------|
| 52. (7×3) | 53. (5×7) | 54. (7×1) |
| 55. (5×3) | 56. (5×2) | 57. (8×2) |

Find the answer.

58. How many threes are there in 22?
59. How many twos are there in 17?
60. How many fives are there in 43?

THE RULE MACHINE

A. The Rule Machine takes a number, uses a rule, and gives out another number.



- The number 2 is going into the machine. This number is the **input**.
- The **rule** in the machine is “Add 3 to the input.”
- The number 5 is the **output**. Adding 3 to 2 gives 5. Using the rule “Add 3” on 2 gives you the ordered pair (2, 5).

B. The rule is “Add 3.”

If the input is 3,
the output is 6.

- Tell what numbers should be shown in the output column.

Add 3	
INPUT	OUTPUT
3	6
4	<u>?</u>
5	<u>?</u>
6	<u>?</u>

✓ What numbers should be shown in the output columns?

Add 2	
INPUT	OUTPUT
2	<u>?</u>
3	<u>?</u>
4	<u>?</u>
5	<u>?</u>

Add 5	
INPUT	OUTPUT
0	<u>?</u>
1	<u>?</u>
2	<u>?</u>
3	<u>?</u>

Add 4	
INPUT	OUTPUT
0	<u>?</u>
1	<u>?</u>
2	<u>?</u>
3	<u>?</u>

EXERCISES

Copy and complete each table.

* 1. **Add 4**

INPUT	OUTPUT
0	4
1	?
2	?
3	?
4	?
5	?
6	?
7	?
8	?
9	?
10	?

2. **Multiply by 5**

INPUT	OUTPUT
0	?
1	?
2	?
3	?
4	?
5	?
6	?
7	?
8	?
9	?
10	?

3. **Multiply by 10**

INPUT	OUTPUT
1	?
3	?
2	?
4	?
6	?
7	?
10	?
8	?
5	?
9	?
0	?

4. **Multiply by 2**

n	$2 \times n$
1	?
4	?
5	?
2	?
3	?
10	?
7	?
8	?
6	?

5. **Subtract 20**

n	$n - 20$
30	?
50	?
100	?
43	?
35	?
23	?
96	?
68	?
84	?

6. **Add 50**

n	$n + 50$
10	?
24	?
32	?
50	?
100	?
200	?
43	?
65	?
74	?

Keeping Up with the Facts

1.
$$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 1 \\ \times 3 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$$

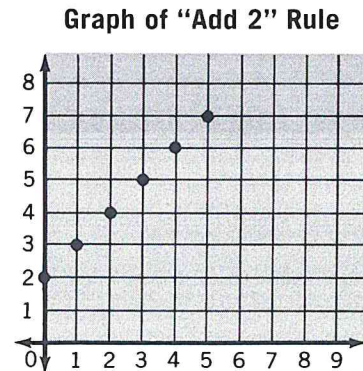
6.
$$\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$$

* 1. 5; 6; 7; 8; 9; 10; 11; 12; 13; 14

GRAPHING RULES

The table shows pairs of numbers for the rule “Add 2.”
When you have located points for number pairs,
you have made a **graph** for the rule.

Add 2 →	
n	$n + 2$
0	2
1	3
2	4
3	5
4	6
5	<u>?</u>



A. Use the rule “Add 2.”

- What is $n + 2$ when n is 5?

B. How do you locate the point for the ordered pair (0, 2)? (1, 3)? (4, 6)?

- Where would you locate the point for (5, 7)?
- What do you notice about the points for all these ordered pairs?

EXERCISES

Complete each table.
Make a graph for each rule.

1. Add 1 →

n	$n + 1$
0	1
2	3
4	<u>?</u>
6	<u>?</u>
8	<u>?</u>

2. Subtract 2 →

n	$n - 2$
2	0
3	1
4	<u>?</u>
5	<u>?</u>
6	<u>?</u>

Complete each table of number pairs. Then make a graph for each rule.

3. **Add 10**

n	$n + 10$
0	10
1	11
4	<u>?</u>
5	<u>?</u>
10	<u>?</u>

4. **Subtract 5**

n	$n - 5$
5	0
10	5
15	<u>?</u>
20	<u>?</u>
25	<u>?</u>

5. **Multiply by 5**

n	$5 \times n$
0	0
1	5
2	<u>?</u>
3	<u>?</u>
4	<u>?</u>

6. **Multiply by 2**

n	$2 \times n$
0	0
1	2
2	<u>?</u>
3	<u>?</u>
4	<u>?</u>
5	<u>?</u>
6	<u>?</u>
7	<u>?</u>
8	<u>?</u>
9	<u>?</u>

7. **Multiply by 3**

n	$3 \times n$
0	0
1	3
2	<u>?</u>
3	<u>?</u>
4	<u>?</u>
5	<u>?</u>
6	<u>?</u>
7	<u>?</u>
8	<u>?</u>
9	<u>?</u>

8. **Multiply by 1**

n	$1 \times n$
0	0
1	1
2	<u>?</u>
3	<u>?</u>
4	<u>?</u>
5	<u>?</u>
6	<u>?</u>
7	<u>?</u>
8	<u>?</u>
9	<u>?</u>

Think Twice

9. **Multiply by n**

n	$n \times n$
0	<u>?</u>
1	<u>?</u>
2	<u>?</u>
3	<u>?</u>

10. **Multiply by $n \times n$**

n	$n \times (n \times n)$
0	<u>?</u>
1	<u>?</u>
2	<u>?</u>
3	<u>?</u>


11. **Multiply by $2 \times n$**

n	$n \times (2 \times n)$
0	<u>?</u>
1	<u>?</u>
2	<u>?</u>
3	<u>?</u>

RULES FOR NUMBER PAIRS

To find the rule, use the pairs in the table.

You can think: What do I do to n to get the second number?

	
n	<u>?</u>
6	3
8	5
10	7
15	12
20	<u>?</u>
24	<u>?</u>

A. What can you do to 6 to get 3?

- Can you divide 6 by 2?
- Can you subtract 3 from 6?

B. Try each rule on the next pair.


- Try the “Divide by 2” rule on 8. How does the number you get compare with the second number in the table?
Does this rule work?
- Try the “Subtract 3” rule. How do the numbers compare?
Does this rule work?

C. Try the “Subtract 3” rule on 10.

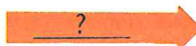
- Do you get the correct second number?
- What rule should be shown in the arrow?
Why should $n - 3$ be shown at the top of the second column?
Copy and complete the table.

EXERCISES


Find the rule. Then copy and complete the table.

1. 

n	<u>?</u>
6	2
8	4
10	6
12	<u>?</u>


2. 

n	<u>?</u>
10	20
12	22
15	25
20	<u>?</u>

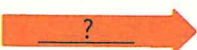
3. 

n	<u>?</u>
0	0
1	2
4	8
5	<u>?</u>

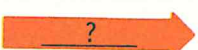
Copy and complete each table.

4. 


n	<u>?</u>
2	1
4	2
6	3
8	4
10	<u>?</u>
12	<u>?</u>
14	<u>?</u>
16	<u>?</u>
18	<u>?</u>

5. 


n	<u>?</u>
0	0
2	20
3	30
5	50
6	<u>?</u>
7	<u>?</u>
8	<u>?</u>
9	<u>?</u>
10	<u>?</u>

6. 

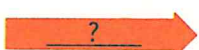
n	<u>?</u>
10	30
20	40
22	42
50	70
75	<u>?</u>
80	<u>?</u>
87	<u>?</u>
92	<u>?</u>
99	<u>?</u>

7. 

n	<u>?</u>
50	0
60	10
75	25
100	<u>?</u>
150	<u>?</u>
275	<u>?</u>
300	<u>?</u>
425	<u>?</u>
475	<u>?</u>

8. 

n	<u>?</u>
0	0
1	1
2	4
3	9
4	<u>?</u>
5	<u>?</u>
7	<u>?</u>
8	<u>?</u>
10	<u>?</u>

9. 

n	<u>?</u>
4	21
17	34
20	37
35	52
50	67
84	<u>?</u>
96	<u>?</u>
100	<u>?</u>
432	<u>?</u>

Keeping Up with the Facts

- | | | | | | |
|---|---|---|--|--|--|
| 1. $\begin{array}{r} 1 \\ \times 4 \\ \hline \end{array}$ | 2. $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$ | 3. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$ | 4. $\begin{array}{r} 8 \\ \times 1 \\ \hline \end{array}$ | 5. $\begin{array}{r} 0 \\ \times 7 \\ \hline \end{array}$ | 6. $\begin{array}{r} 6 \\ \times 0 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$ | 8. $\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$ | 9. $\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$ | 10. $\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$ | 11. $\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$ | 12. $\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$ |

CHECKPOINT

✓ Check your understanding of **key terms and phrases**.

Use each of the following in a sentence.

reflection

line symmetry

plane symmetry

face

rectangular closed surface

surface

sphere

ordered pair

rule

input

output

graph

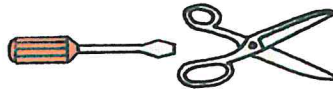
✓ Check your understanding of **key ideas**.

1a. Which is a line of symmetry?



1b. When does a figure have line symmetry? What is a line of symmetry?

2a. Which has plane symmetry?

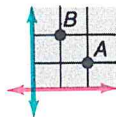


2b. When does a figure have plane symmetry? What is a plane of symmetry?

3a. Which ordered pair directs you to point A?

(2, 1)

(1, 2)



3b. Tell how to locate a point on a grid.

✓ Check your **skills**.

Complete each table.

1. Add 6

n	$n + 6$
3	<u>?</u>
7	<u>?</u>
11	<u>?</u>
28	<u>?</u>

2. Multiply by 3

n	$n \times 3$
0	<u>?</u>
2	<u>?</u>
5	<u>?</u>
8	<u>?</u>

3. ?

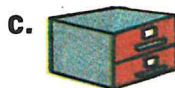
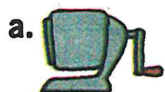
n	<u>?</u>
5	0
10	5
15	10
20	<u>?</u>

UNIT TEST

Find the answers.

1. Which letter does *not* have line symmetry? **M S H**

2. Which figure has plane symmetry?



3. Which is a model of a sphere?

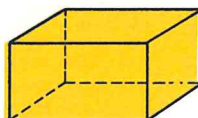


4. How many faces does this rectangular closed surface have?

a. 4

b. 5

c. 6



Complete each table.

5. **Subtract 5**

Input	Output
5	0
17	12
23	?

6. **Multiply By 2**

n	$n \times 2$
2	4
5	10
12	?

7. **?**

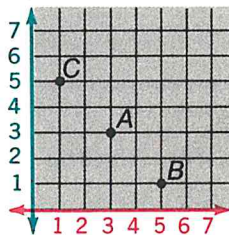
n	?
3	4
10	11
25	26

Use the grid to answer questions 8, 9, and 10.

8. What is the number pair for point A?

9. The pair (5, 1) locates which point?

10. Is point (0, 2) on the red line or on the blue line?



If you have time, try these.

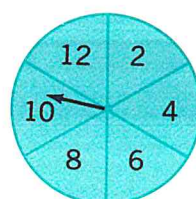
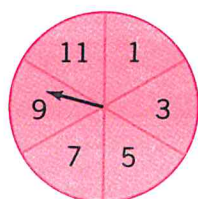
11. What number is halfway between 20 and 30?

12. What number is halfway between 25 and 30?

INQUIRY INTO NUMBER

In The Hole

Play the game *In The Hole* with your friends. Make your own game pieces and spinners. Use the board on the opposite page.



- Place your game piece on 0 and spin both spinners.
- Move up toward the carrot the number of spaces shown on the red spinner. Move down toward the empty cupboard the number of spaces shown on the blue spinner.
- If someone gets to the cupboard, he is out of the game.
- The person who gets to the carrot first wins the game.

SAMPLE TURNS

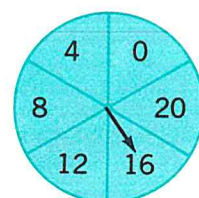
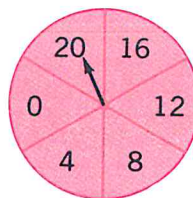
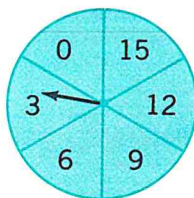
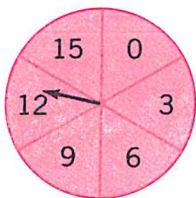
Copy and complete the chart.

- Suppose you get a red 3 and a blue 6. You move up 3 and back 6. Where do you land?
- Could you first move back 6 and then up 3?

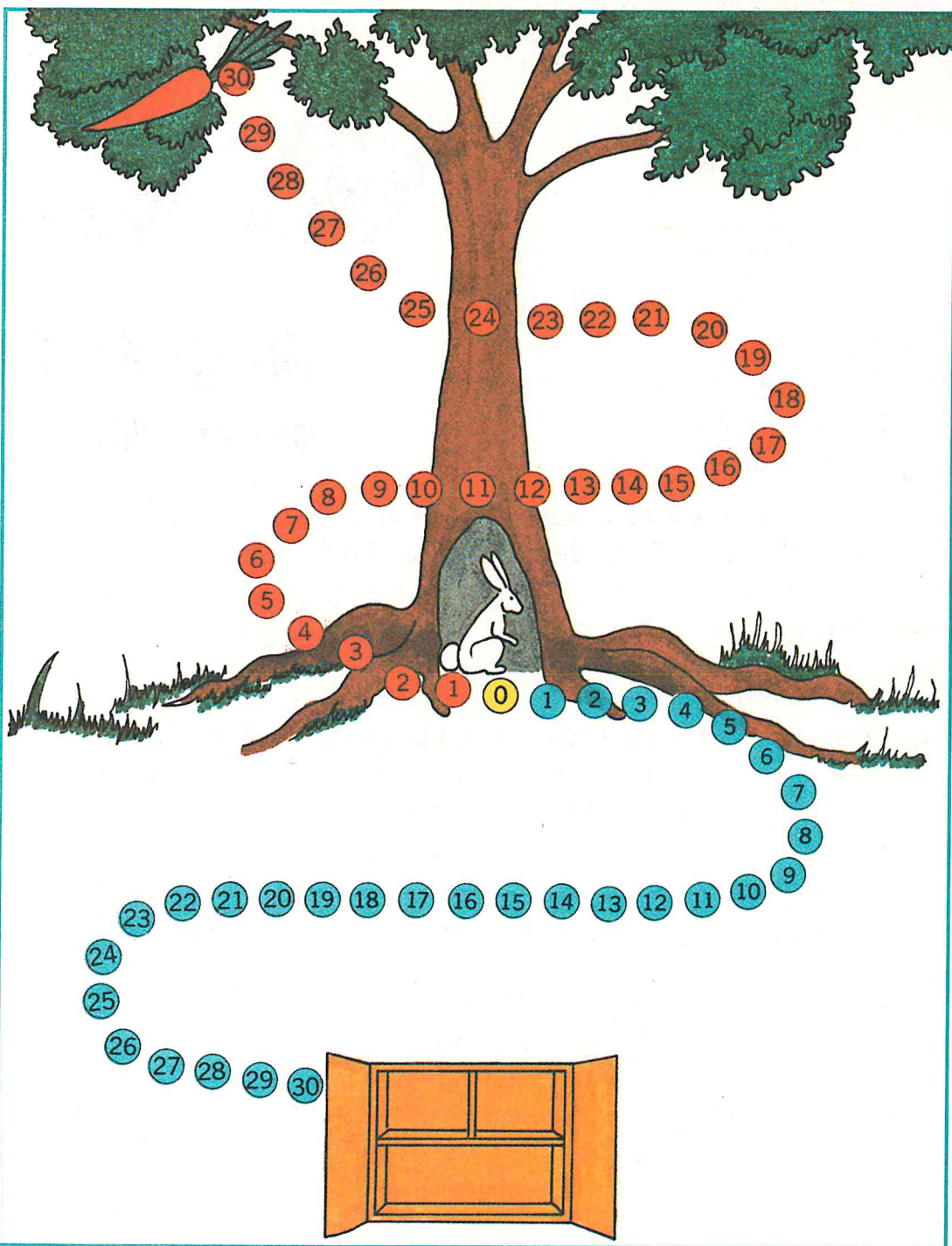
TURNS	SPIN RED	SPIN BLUE	LANDS ON
1st	3	6	③
2nd	7	2	②
3rd	11	4	?

For Further Inquiry

Make these spinners and play the game.



IN THE HOLE



MULTIPLYING HUNDREDS

A. Think of 2 sets of dollar bills with 4 in each set.

■ $2 \times 4 = 8$

So there are ? dollar bills.



B. Think of each dollar as 100 cents.

■ $2 \times 4 = 8$

So 2×4 hundreds = ? hundreds

■ $2 \times 400 = 800$

So there are ? cents.



✓ $3 \times 2 = 6$, so 3×2 hundreds = ? hundreds, and $3 \times 200 = \underline{\hspace{1cm}}$
 $4 \times 5 = 20$, so 4×5 hundreds = ? hundreds, and $4 \times 500 = \underline{\hspace{1cm}}$

EXERCISES

Find the answer.

*1. $3 \times 2 = n$ 3×2 hundreds = n hundreds

$3 \times 200 = y$

2. $2 \times 4 = n$ 2×4 hundreds = n hundreds

$2 \times 400 = y$

3. $5 \times 3 = n$ 5×3 hundreds = n hundreds

$5 \times 300 = y$

4. $8 \times 5 = n$ 8×5 hundreds = n hundreds

$8 \times 500 = y$

5. $4 \times 200 = y$

6. $5 \times 100 = y$

7. $2 \times 700 = y$

8. $1 \times 500 = y$

9. $5 \times 600 = y$

10. $6 \times 300 = y$

*11. $\begin{array}{r} 600 \\ \times 2 \\ \hline \end{array}$

12. $\begin{array}{r} 700 \\ \times 2 \\ \hline \end{array}$

13. $\begin{array}{r} 400 \\ \times 2 \\ \hline \end{array}$

14. $\begin{array}{r} 600 \\ \times 3 \\ \hline \end{array}$

15. $\begin{array}{r} 900 \\ \times 3 \\ \hline \end{array}$

16. $\begin{array}{r} 400 \\ \times 3 \\ \hline \end{array}$

17. $\begin{array}{r} 800 \\ \times 3 \\ \hline \end{array}$

18. $\begin{array}{r} 700 \\ \times 5 \\ \hline \end{array}$

19. $\begin{array}{r} 900 \\ \times 5 \\ \hline \end{array}$

20. $\begin{array}{r} 600 \\ \times 5 \\ \hline \end{array}$

* 1. 6; 6; 600

11. 1200

ESTIMATING PRODUCTS

In June, 220 boys went to camp. Another 220 went in July and 220 more in August. How many boys went altogether?

A. Suppose you do not know how to name the product of 3 and 220. You can use the number line to help you estimate the product.

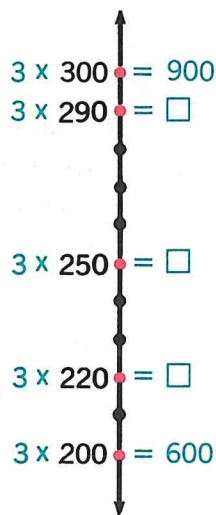
- Is 220 closer to 200 or to 300? Then is 3×220 closer to 3×200 or to 3×300 ?
- Why is 600 a better estimate than 900?

B. Estimate the product of 3 and 290.

- Is 290 closer to 200 or 300? Then is 3×290 closer to 3×200 or to 3×300 ?

C. Suppose you are asked to estimate the product of 3 and 250.

- Why is the product of 3 and 250 midway between 600 and 900?



EXERCISES

Choose the best estimate from the set given.

- $2 \times 368 = \square$ {400, 600, 800}
- $3 \times 340 = \square$ {900, 1200, 1500}
- $5 \times 125 = \square$ {500, 800, 1000}
- $2 \times 698 = \square$ {1000, 1200, 1400}

Write the estimate only.

- | | | | |
|--------------------|--------------------|--------------------|--------------------|
| 5. 2×217 | 6. 2×296 | 7. 2×750 | 8. 2×791 |
| 9. 5×309 | 10. 5×399 | 11. 5×432 | 12. 5×485 |
| 13. 3×464 | 14. 3×218 | 15. 3×291 | 16. 3×453 |

MULTIPLYING ONES, TENS, AND HUNDREDS

To find the total number of nails in the boxes, you can add or you can multiply.



A. Find the number of nails by addition.

■ $214 + 214 + 214 = \underline{\quad ? \quad}$

B. To find the number of nails by multiplication, you can think:

■ 200 nails in each box. $3 \times 200 = \underline{\quad ? \quad}$

10 nails in each box. $3 \times 10 = \underline{\quad ? \quad}$

4 nails in each box. $3 \times 4 = \underline{\quad ? \quad}$

■ Add the results. $600 + 30 + 12 = \underline{\quad ? \quad}$

■ How does your answer in **B** compare with your answer in **A**?

■ There are $\underline{\quad ? \quad}$ nails in the 3 boxes.

C. You can show the distributive property used in **B** like this.

$$\begin{aligned} 3 \times 214 &= 3 \times (200 + 10 + 4) \\ &= (3 \times 200) + (3 \times 10) + (3 \times 4) \\ &= 600 + 30 + 12 \\ &= 642 \end{aligned}$$

■ How is the way shown in **B** like the way shown in **C**?

✓ Complete each example.

$$\begin{aligned} \blacksquare 5 \times 241 &= 5 \times (200 + 40 + 1) \\ &= (5 \times \underline{\quad ? \quad}) + (5 \times 40) + (5 \times \underline{\quad ? \quad}) \\ &= \underline{\quad ? \quad} + 200 + \underline{\quad ? \quad} \\ &= \underline{\quad ? \quad} \end{aligned}$$

$$\begin{aligned} \blacksquare 3 \times 265 &= \underline{\quad ? \quad} \times (200 + 60 + 5) \\ &= (\underline{\quad ? \quad} \times 200) + (\underline{\quad ? \quad} \times 60) + (\underline{\quad ? \quad} \times 5) \\ &= \underline{\quad ? \quad} + \underline{\quad ? \quad} + \underline{\quad ? \quad} \\ &= \underline{\quad ? \quad} \end{aligned}$$

EXERCISES

Copy. Complete each to make a true sentence.

*1. $5 \times 126 = 5 \times (\underline{\quad} + 20 + \underline{\quad})$

2. $5 \times 248 = \underline{\quad} \times (200 + 40 + 8)$

3. $3 \times 291 = 3 \times (\underline{\quad} + \underline{\quad} + \underline{\quad})$

4. $5 \times \underline{\quad} = 5 \times (300 + 60 + 2)$

*5. $2 \times (300 + 40 + 5) = (2 \times 300) + (2 \times \underline{\quad}) + (2 \times \underline{\quad})$

6. $3 \times (700 + 30 + 6) = (3 \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$

7. $5 \times (200 + 50 + 1) = (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$

8. $5 \times (800 + 90 + 2) = (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$

Copy and complete.

$$\begin{aligned} 9. \quad 2 \times 324 &= 2 \times (300 + \underline{\quad} + \underline{\quad}) \\ &= (2 \times 300) + (2 \times \underline{\quad}) + (2 \times \underline{\quad}) \\ &= \underline{\quad} + \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 10. \quad 3 \times 536 &= \underline{\quad} \times (500 + 30 + 6) \\ &= (\underline{\quad} \times 500) + (\underline{\quad} \times 30) + (\underline{\quad} \times 6) \\ &= \underline{\quad} + \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

$$\begin{aligned} 11. \quad 5 \times 471 &= \underline{\quad} \times (\underline{\quad} + \underline{\quad} + \underline{\quad}) \\ &= (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) \\ &= \underline{\quad} + \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

Find n . Use the method shown in C.

12. $3 \times 321 = n$

13. $5 \times 248 = n$

14. $3 \times 526 = n$

15. $3 \times 256 = n$

16. $5 \times 837 = n$

17. $2 \times 964 = n$

18. $2 \times 896 = n$

19. $2 \times 738 = n$

20. $5 \times 475 = n$

*1. $5 \times 126 = 5 \times (100 + 20 + 6)$

5. $2 \times (300 + 40 + 5) = (2 \times 300) + (2 \times 40) + (2 \times 5)$

USING THE DISTRIBUTIVE PROPERTY

$$5 \times 248 = (5 \times 200) + (5 \times 40) + (5 \times 8)$$

$$\begin{array}{r} 248 \\ \times 5 \\ \hline 40 \\ 200 \\ 1000 \\ \hline \end{array}$$

A. How was the distributive property used to multiply 5×248 in the number sentence?

B. In the vertical example you can think of 248 as $(200 + 40 + 8)$.

■ What must you do in the example to find the answer?

C. The numerals in blue show how you can think to use the distributive property. Tell how each example is done.

a.

$$\begin{array}{r} 324 \\ \times 2 \\ \hline 2 \times 4 \longrightarrow 8 \\ 2 \times 20 \longrightarrow 40 \\ 2 \times 300 \longrightarrow 600 \\ \hline 2 \times 324 \longrightarrow 648 \end{array}$$

b.

$$\begin{array}{r} 524 \\ \times 3 \\ \hline 3 \times 4 \longrightarrow 12 \\ 3 \times 20 \longrightarrow 60 \\ 3 \times 500 \longrightarrow 1500 \\ \hline 3 \times 524 \longrightarrow 1572 \end{array}$$

EXERCISES

Copy and complete.

- * 1. $5 \times 316 = (5 \times 300) + (5 \times \underline{\quad}) + (5 \times \underline{\quad})$
2. $3 \times 177 = (\underline{\quad} \times 100) + (\underline{\quad} \times 70) + (\underline{\quad} \times 7)$
3. $2 \times 298 = (2 \times \underline{\quad}) + (2 \times \underline{\quad}) + (2 \times \underline{\quad})$
4. $6 \times 352 = (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$

* 1. $5 \times 316 = (5 \times 300) + (5 \times 10) + (5 \times 6)$

Copy and complete.

5.

$$\begin{array}{r} 312 \\ \times 3 \\ \hline \end{array}$$

$3 \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 6 \quad}$
 $3 \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 30 \quad}$
 $3 \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 900 \quad}$
 $3 \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 936 \quad}$

6.

$$\begin{array}{r} 237 \\ \times 3 \\ \hline \end{array}$$

$\underline{\quad ? \quad} \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 21 \quad}$
 $\underline{\quad ? \quad} \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 90 \quad}$
 $\underline{\quad ? \quad} \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 600 \quad}$
 $\underline{\quad ? \quad} \times \underline{\quad ? \quad} \longrightarrow \underline{\quad 711 \quad}$

7. 742

$$\begin{array}{r} \times 5 \\ \hline 10 \\ ??? \\ 3500 \\ \hline \end{array}$$

8. 658

$$\begin{array}{r} \times 2 \\ \hline ?? \\ ??? \\ \hline \end{array}$$

9. 156

$$\begin{array}{r} \times 3 \\ \hline ?? \\ ??? \\ \hline \end{array}$$

Estimate the product. Then multiply using the method shown in C.

*10. 234

$$\begin{array}{r} \times 2 \\ \hline \end{array}$$

11. 341

$$\begin{array}{r} \times 3 \\ \hline \end{array}$$

12. 235

$$\begin{array}{r} \times 5 \\ \hline \end{array}$$

13. 486

$$\begin{array}{r} \times 5 \\ \hline \end{array}$$

14. 375

$$\begin{array}{r} \times 2 \\ \hline \end{array}$$

15. 369

$$\begin{array}{r} \times 3 \\ \hline \end{array}$$

16. 364

$$\begin{array}{r} \times 2 \\ \hline \end{array}$$

17. 489

$$\begin{array}{r} \times 5 \\ \hline \end{array}$$

18. 327

$$\begin{array}{r} \times 3 \\ \hline \end{array}$$

19. 325

$$\begin{array}{r} \times 8 \\ \hline \end{array}$$

20. 523

$$\begin{array}{r} \times 9 \\ \hline \end{array}$$

21. 621

$$\begin{array}{r} \times 5 \\ \hline \end{array}$$

22. 734

$$\begin{array}{r} \times 2 \\ \hline \end{array}$$

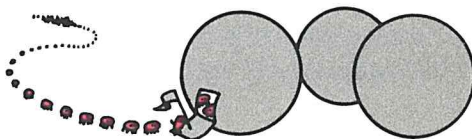
23. 626

$$\begin{array}{r} \times 3 \\ \hline \end{array}$$

24. 938

$$\begin{array}{r} \times 5 \\ \hline \end{array}$$

25. About 928 fleas will fit inside a ping-pong ball. How many fleas will fit inside 3 ping-pong balls?



* 10. 400; 468

A SHORT WAY TO MULTIPLY

A. Here is a short way to find the product of 3 and 12.

$$\begin{array}{r} 12 \\ \times 3 \\ \hline \end{array}$$

$3 \times 2 \longrightarrow 6$

Multiply 2 ones by 3.
Where do you write 6?



$$\begin{array}{r} 12 \\ \times 3 \\ \hline \end{array}$$

$3 \times 10 \longrightarrow 36$

Multiply 1 ten by 3.
Where do you write 3?

B. Look at the two examples.
See if you can find out how
to multiply a short way.

- What does the red 2 in
each example show?

$$\begin{array}{r} 65 \\ \times 5 \\ \hline 25 \\ 300 \\ \hline 325 \end{array}$$

C. Here are the key steps for the short form.

$$\begin{array}{r} 65 \\ \times 5 \\ \hline 5 \end{array}$$

$5 \times 5 = 25$. Since 25 is
greater than 9 ones, you
must rename 25. How?
Write 5 in the ones place.
You can write 2 to
remember 2 tens.



$$\begin{array}{r} 65 \\ \times 5 \\ \hline 25 \\ 300 \\ \hline 325 \end{array}$$

$5 \times 6 \text{ tens} = 30 \text{ tens}$
Add 2 tens.
 $30 \text{ tens} + 2 \text{ tens} = ? \text{ tens}$
To show 32 tens, write 2
in the tens place and 3
in the hundreds place.

- ✓ You need to rename if the product for ones is 10 or more.
Do you need to rename in 3×32 ? in 3×33 ? in 3×34 ?

EXERCISES

Find each product.

$$\begin{array}{r} *1. \ 22 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \ 51 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \ 21 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \ 24 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \ 63 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \ 72 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \ 11 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \ 42 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \ 53 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \ 72 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} *11. \ 57 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \ 25 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \ 71 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \ 55 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \ 52 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \ 25 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 17. \ 15 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 18. \ 22 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \ 35 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \ 52 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 21. \ 53 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 22. \ 25 \\ \times 8 \\ \hline \end{array}$$

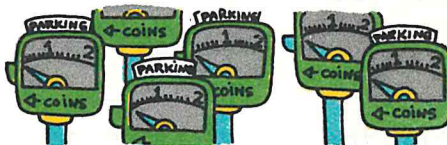
$$\begin{array}{r} 23. \ 47 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 24. \ 26 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 25. \ 85 \\ \times 2 \\ \hline \end{array}$$

Find the answer.

26. How many parking meters are needed to make 5 rows with 31 meters in a row?



27. Barry has 2 packages of cards. There are 52 cards in each package. How many cards does he have?



28. Russ has 2 jars of vitamin pills. There are 28 pills in each jar. How many pills does he have?



HOW MUCH MONEY?

A. A can of frozen juice is \$.31. Vicki wants to buy 5 cans. To find how much money to pay, she multiplies.

- Vicki thinks: \$.31 is the same as 31 cents.



- Vicki remembers to write the dollar sign and cents point in the answer.

EXERCISES

Use the whole number example to help you do the money example.

$$\begin{array}{r} 1. \quad 80 \\ \times 5 \\ \hline 400 \end{array} \quad \begin{array}{r} \$. 80 \\ \times 5 \\ \hline \$? . ? ? \end{array}$$

$$\begin{array}{r} 2. \quad 21 \\ \times 6 \\ \hline 126 \end{array} \quad \begin{array}{r} \$. 21 \\ \times 6 \\ \hline \$? . ? ? \end{array}$$

Find the answer. Remember the dollar sign and cents point.

$$\begin{array}{r} *3. \quad \$.20 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad \$.50 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad \$.60 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad \$.91 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad \$.51 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad \$.91 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad \$.50 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad \$.81 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad \$.41 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad \$.22 \\ \times 3 \\ \hline \end{array}$$

13. Rope costs 21¢ a foot. How much will 7 feet of rope cost?

14. Find the cost of 5 yards of ribbon at \$.31 a yard; at \$.51 a yard; at \$.71 a yard; at \$.50 a yard.

* 3. \$1.40

RENAMING ONES IN MULTIPLICATION

- A.** The short form for multiplying hundreds is like the short form for multiplying tens. Can you tell how the short form is done?

$$\begin{array}{r} 439 \\ \times 2 \\ \hline 18 \\ 60 \\ 800 \\ \hline 878 \end{array}$$

- B.** Below are the key steps for the short form.

$$\begin{array}{r} 1 \\ 439 \\ \times 2 \\ \hline 8 \end{array}$$



$$\begin{array}{r} 1 \\ 439 \\ \times 2 \\ \hline 78 \end{array}$$



$$\begin{array}{r} 1 \\ 439 \\ \times 2 \\ \hline 878 \end{array}$$

$2 \times 9 = ?$

What do you write in the ones place?
You can write 1 to remember 1 ten.

$2 \times 3 \text{ tens} = ? \text{ tens}$

6 tens + 1 ten = 7 tens
Why do you write 7 in the tens place?

$2 \times 4 \text{ hundreds}$

= 8 hundreds
What do you write in the hundreds place?

- ✓ When do you need to rename ones?

Do you need to rename in 2×432 ? in 2×434 ? in 2×435 ?

EXERCISES

Estimate each product. Then find the product.

*1. $\begin{array}{r} 339 \\ \times 2 \\ \hline \end{array}$

2. $\begin{array}{r} 112 \\ \times 8 \\ \hline \end{array}$

3. $\begin{array}{r} 319 \\ \times 2 \\ \hline \end{array}$

4. $\begin{array}{r} 227 \\ \times 3 \\ \hline \end{array}$

5. $\begin{array}{r} 416 \\ \times 2 \\ \hline \end{array}$

*6. $\begin{array}{r} \$1.14 \\ \times 5 \\ \hline \end{array}$

7. $\begin{array}{r} \$3.19 \\ \times 5 \\ \hline \end{array}$

8. $\begin{array}{r} \$2.46 \\ \times 2 \\ \hline \end{array}$

9. $\begin{array}{r} \$3.24 \\ \times 3 \\ \hline \end{array}$

10. $\begin{array}{r} \$2.13 \\ \times 4 \\ \hline \end{array}$

* 1. 600; 678

6. \$5.00; \$5.70

RENAMING TENS IN MULTIPLICATION

A. You can rename tens in the short form this way.

$$\begin{array}{r} 562 \\ \times 3 \\ \hline 6 \end{array}$$



$$\begin{array}{r} 1 \\ 562 \\ \times 3 \\ \hline 86 \end{array}$$



$$\begin{array}{r} 1 \\ 562 \\ \times 3 \\ \hline 1686 \end{array}$$

$3 \times 2 = ?$
Must you rename?
Write 6 in the
ones place.

3×6 tens = ? tens
Rename 18 tens. Write
8 in the tens place.
You can write 1 to
remember 1 hundred.

3×5 hundreds = ?
Add 1 hundred.
How many hundreds
is that?
Write 16 with 6 in
the hundreds place.

✓ You must rename if the product for tens is 10 tens or more.
Do you need to rename in 3×512 ? in 3×532 ? in 3×542 ?

EXERCISES

Estimate each product. Then find the product.

*1. $\begin{array}{r} 374 \\ \times 2 \\ \hline \end{array}$

2. $\begin{array}{r} 164 \\ \times 2 \\ \hline \end{array}$

3. $\begin{array}{r} 344 \\ \times 2 \\ \hline \end{array}$

4. $\begin{array}{r} 441 \\ \times 5 \\ \hline \end{array}$

5. $\begin{array}{r} 291 \\ \times 3 \\ \hline \end{array}$

6. $\begin{array}{r} 242 \\ \times 3 \\ \hline \end{array}$

7. $\begin{array}{r} 383 \\ \times 2 \\ \hline \end{array}$

8. $\begin{array}{r} 272 \\ \times 2 \\ \hline \end{array}$

9. $\begin{array}{r} 141 \\ \times 5 \\ \hline \end{array}$

10. $\begin{array}{r} 263 \\ \times 5 \\ \hline \end{array}$

*11. $\begin{array}{r} \$4.43 \\ \times 3 \\ \hline \end{array}$

12. $\begin{array}{r} \$5.72 \\ \times 3 \\ \hline \end{array}$

13. $\begin{array}{r} \$5.63 \\ \times 2 \\ \hline \end{array}$

14. $\begin{array}{r} \$7.51 \\ \times 2 \\ \hline \end{array}$

15. $\begin{array}{r} \$3.91 \\ \times 5 \\ \hline \end{array}$

*1. 800; 748

11. \$12.00; \$13.29

ZERO IN MULTIPLICATION

- A.** How is 406 renamed? $3 \times 406 = 3 \times (400 + 0 + 6)$
 ■ What is the product? $= (3 \times 400) + (3 \times 0) + (3 \times 6)$
 ■ Do you get the same answer if you rename 406 as $(400 + 6)$? $= 1200 + 0 + 18$
 $= \underline{\quad ? \quad}$

- B.** Here are the steps for the short form.

$$\begin{array}{r} 1 \\ 406 \\ \times 3 \\ \hline 8 \end{array}$$



$$\begin{array}{r} 1 \\ 406 \\ \times 3 \\ \hline 18 \end{array}$$



$$\begin{array}{r} 1 \\ 406 \\ \times 3 \\ \hline 1218 \end{array}$$

Tell how you begin.

3×0 tens = 0 tens
 Add 1 ten.
 0 tens + 1 ten = $\underline{\quad ? \quad}$
 Where do you write 1?

Tell how you complete the example.

EXERCISES

Estimate each product. Then find the product.

*1. $\begin{array}{r} 404 \\ \times 3 \\ \hline \end{array}$

2. $\begin{array}{r} 302 \\ \times 3 \\ \hline \end{array}$

3. $\begin{array}{r} 310 \\ \times 3 \\ \hline \end{array}$

4. $\begin{array}{r} 350 \\ \times 3 \\ \hline \end{array}$

5. $\begin{array}{r} 370 \\ \times 3 \\ \hline \end{array}$

6. $\begin{array}{r} 403 \\ \times 3 \\ \hline \end{array}$

7. $\begin{array}{r} 202 \\ \times 2 \\ \hline \end{array}$

8. $\begin{array}{r} 706 \\ \times 2 \\ \hline \end{array}$

9. $\begin{array}{r} 850 \\ \times 2 \\ \hline \end{array}$

10. $\begin{array}{r} 790 \\ \times 2 \\ \hline \end{array}$

11. $\begin{array}{r} 106 \\ \times 2 \\ \hline \end{array}$

12. $\begin{array}{r} 320 \\ \times 2 \\ \hline \end{array}$

13. $\begin{array}{r} 407 \\ \times 5 \\ \hline \end{array}$

14. $\begin{array}{r} 590 \\ \times 5 \\ \hline \end{array}$

15. $\begin{array}{r} 680 \\ \times 5 \\ \hline \end{array}$

16. $\begin{array}{r} 203 \\ \times 5 \\ \hline \end{array}$

17. $\begin{array}{r} 910 \\ \times 5 \\ \hline \end{array}$

18. $\begin{array}{r} 730 \\ \times 5 \\ \hline \end{array}$

* 1. 1200; 1212

RENAMING TWICE IN MULTIPLICATION

A. When you rename twice, you use two ideas you already know.
Can you tell what the two ideas are?

$$\begin{array}{r} \textcolor{red}{4} \\ 379 \\ \times 5 \\ \hline \textcolor{red}{5} \end{array}$$



$$\begin{array}{r} \textcolor{red}{34} \\ 379 \\ \times 5 \\ \hline \textcolor{red}{95} \end{array}$$



$$\begin{array}{r} \textcolor{red}{34} \\ 379 \\ \times 5 \\ \hline \textcolor{red}{1895} \end{array}$$

$5 \times 9 = \underline{\quad ? \quad}$

Where do you write 5? You can write 4 to remember 4 tens.

$5 \times 7 = \underline{\quad ? \quad}$

Add 4. $35 + 4 = 39$
Where do you write 9?
You can write 3 to remember 3 hundreds.

$5 \times 3 = \underline{\quad ? \quad}$

Add 3. $15 + 3 = 18$
Write 18 with 8 in the hundreds place.

- In the first step, you rename ones. Why were the tens renamed in the second step?

EXERCISES

Estimate the product. Then find the product.

*1. $\begin{array}{r} 367 \\ \times 2 \\ \hline \end{array}$

2. $\begin{array}{r} 294 \\ \times 5 \\ \hline \end{array}$

3. $\begin{array}{r} 167 \\ \times 5 \\ \hline \end{array}$

4. $\begin{array}{r} 482 \\ \times 3 \\ \hline \end{array}$

5. $\begin{array}{r} 105 \\ \times 5 \\ \hline \end{array}$

6. $\begin{array}{r} 525 \\ \times 4 \\ \hline \end{array}$

7. $\begin{array}{r} 627 \\ \times 5 \\ \hline \end{array}$

8. $\begin{array}{r} 235 \\ \times 7 \\ \hline \end{array}$

9. $\begin{array}{r} 252 \\ \times 8 \\ \hline \end{array}$

10. $\begin{array}{r} 473 \\ \times 3 \\ \hline \end{array}$

11. $\begin{array}{r} 353 \\ \times 5 \\ \hline \end{array}$

12. $\begin{array}{r} 152 \\ \times 6 \\ \hline \end{array}$

13. $\begin{array}{r} 887 \\ \times 2 \\ \hline \end{array}$

14. $\begin{array}{r} 426 \\ \times 5 \\ \hline \end{array}$

15. $\begin{array}{r} 869 \\ \times 2 \\ \hline \end{array}$

16. $\begin{array}{r} 179 \\ \times 3 \\ \hline \end{array}$

17. $\begin{array}{r} 394 \\ \times 5 \\ \hline \end{array}$

18. $\begin{array}{r} 532 \\ \times 9 \\ \hline \end{array}$

19. $\begin{array}{r} 532 \\ \times 7 \\ \hline \end{array}$

20. $\begin{array}{r} 475 \\ \times 3 \\ \hline \end{array}$

* 1. 800; 734

KEEPING UP IN MATHEMATICS

Find the answer. Then check.

[68-71, 114-21]

$$\begin{array}{r} 1. \quad 79 \\ + 53 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 439 \\ + 225 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 675 \\ + 283 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 289 \\ + 271 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 439 \\ + 522 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 380 \\ - 254 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 407 \\ - 178 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 255 \\ - 147 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 895 \\ - 678 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 907 \\ - 459 \\ \hline \end{array}$$

Complete each sentence. [86, 103]

11. A half dollar is worth 1 quarter, 1 dime, and ? nickels.

12. A dollar is worth 3 quarters and ? nickels.

13. A dollar is worth 2 quarters and ? dimes.

14. A yard makes ? feet; a foot makes ? inches.

Name the greatest whole number you can with the digits below.

[26-27]

15. 7, 5, and 9

16. 2, 8, and 7

Name the least whole number you can with the digits below.

[26-27]

17. 7, 5, and 9

18. 2, 8, and 7

Find the answer. [139, 148-49]

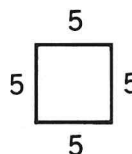
19. There are 5 school days in a week. How many school days are there in 2 weeks? 5 weeks? 9 weeks?

20. Susan is buying 5 pretzels. They cost 5¢ each. What will their total cost be?

21. Roy bought 5 candy bars. The candy bars cost a quarter. How much did he pay for each candy bar?

22. A pint of ice cream fills 5 ice cream cones. How many pints are needed for 30 cones?

23. What is the total length of the sides of this square?



TOO MUCH INFORMATION

A. Lilly needs 24 inches of string for a puppet string. String costs 25¢ a roll. How much string does she need for 4 puppet strings?

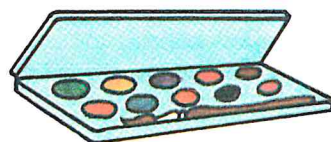
- What question does the problem ask?
- What do you need to know to solve the problem?
- What given information is not needed?



EXERCISES

Tell the information that is not needed. Then solve the problem.

1. A paint box costs 50¢. Each box has 10 colors. John has 27¢. He needs ? more cents.



2. Joe works 3 hours. He earns 75¢. He had 38¢. He has ? ¢ now.

3. It is July 3. The time is 8:50 P.M. After 10 minutes pass, the time is ? .



4. Pete has 100 hard candies. He has 36 candies in a bag. He has 80 soft candies. He has ? more hard candies than soft candies.

5. The clown has 25 balloons for sale. They cost 5¢ each. Then 6 break. The clown has ? balloons left.



NOT ENOUGH INFORMATION

A. Otis had 25¢.

He bought an ice cream cone.

How much money does he have left?



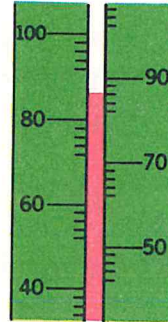
- Is there enough information to answer the question?
- What else do you need to know to solve the problem?

EXERCISES

What else do you need to know to solve the problem?

Do not try to solve the problems.

1. The temperature in Miami is 86 degrees.
That is ? degrees warmer than the
temperature in Denver.
2. A book costs 98¢.
Sue needs ? more cents to buy the book.
3. Tom weighs 73 pounds.
He weighs ? more pounds than his friend.
4. Last year Mary was 56 inches tall.
She grew ? inches this year.
5. Lois jumped rope 29 times in a row.
That is ? more times than Beth.
6. The sun rose at 5:48 A.M.
It set ? hours later.
7. There are 271 boys in the Avon school.
There are ? children in the school in all.



WHAT AM I?

It is fun to use your mind to reason.
Use it to solve the puzzles on this page.
You may ask no more than two questions.
They can be answered only by Yes or No.

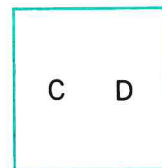
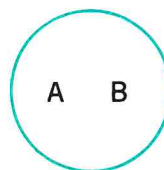
A. I am one of the marbles.
What color am I?

- Ed asks, "Are you above the line?" The answer is "Yes."
What does Ed know?
- Ed asks, "Are you red?"
The answer is "No."
What does Ed know now?
What color is the marble?



B. I am one of the letters.
What letter am I?

- Sue asks, "Are you inside the circle?"
The answer is "No."
What does Sue know now?
- Sue asks, "Are you the letter C?"
The answer is "No."
What does Sue know now?
What is the letter?



- ✓ Suppose the answer to Sue's first question had been "Yes."
 - What would she know?
 - What would be a good second question to ask?

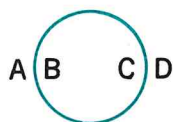
EXERCISES

I am one of the letters. Ask no more than two questions to find what letter I am.

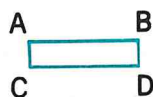
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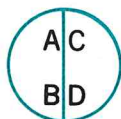
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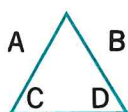
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4.



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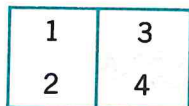


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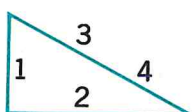


I am one of the numbers. Ask no more than two questions to find what number I am.

7.



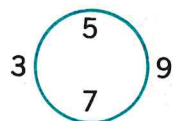
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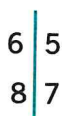
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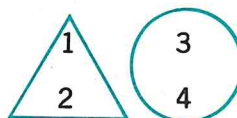
10.



11.



12.



13. {1, 2, 3, 4}

14. {1, 2, 10, 20}

15. {1, 2, 100, 200}

16. I am one of these dogs.

Ask no more than two questions to find what dog I am.

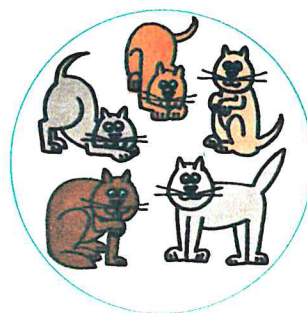


THE MEANING OF ALL

If you want to think and to speak clearly when studying mathematics, then you need to understand the meaning of certain words. One word that is used often is **all**.

A. Look at the set of 5 cats.

- Is each cat inside the ring?
Is every cat inside the ring?
All 5 cats are inside the ring.
- Are any cats outside the ring?
Is one cat outside the ring?
None of the 5 cats is outside the ring.



B. Think of the pictures inside the large circle as birds.
Think of the pictures inside the small circle as bluebirds.
What do you think the circle diagram shows?

- Is each bluebird inside the circle for birds? *All means each one or every single one.*
- Which sentence below tells what the circle diagram shows?
 - a. *All birds are bluebirds.*
 - b. *All bluebirds are birds.*



C. Look at the circle diagram below. Is any part of one circle inside the other circle? Tell what the circle diagram shows.

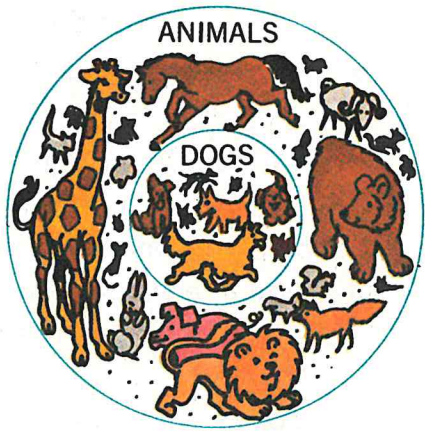
- Which sentences below tells what the circle diagram shows?
 - a. *All birds are fish.*
 - b. *No birds are fish.*
 - c. *All fish are birds.*
 - d. *No fish are birds.*



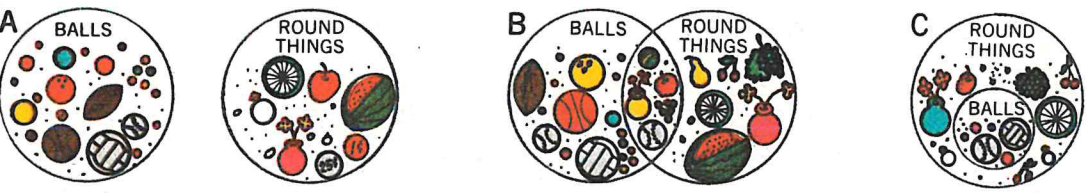
EXERCISES

Use the circle diagram. Write *True* or *False* for each sentence.

- *1. All of the circle for dogs is inside the circle for animals.
- 2. Every dog is an animal.
- 3. All dogs are animals.
- 4. Each animal is a dog.
- *5. All animals are dogs.
- 6. There is a dog that is not an animal.
- 7. At least one animal is not a dog.
- 8. At least one dog is not an animal.
- 9. No dog is an animal.
- 10. None of the dogs is an animal.



Look at the three circle diagrams below.



11. Which diagram shows that “All balls are round”?

Only one sentence in each pair is true. Which one?

- 12. a. All even numbers are whole numbers.
b. All whole numbers are even numbers.
- 13. a. All numbers are whole numbers.
b. All whole numbers are numbers.
- 14. a. All fractional numbers are numbers.
b. All numbers are fractional numbers.
- 15. a. All circles are sets of points.
b. All sets of points are circles.

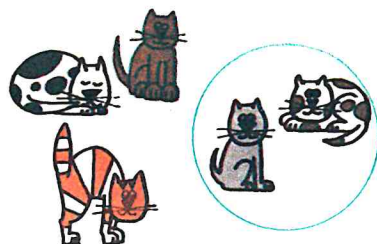
* 1. True. 5. False. 12. a

THE MEANING OF SOME

Another word that is important in mathematics is **some** as used in the sentence, “*Some* members of the set are red.”

A. Look at the set of 5 cats.

- Are *all* cats inside the circle?
Are *no* cats inside the circle?
Is at least one cat inside the circle?
Some cats are inside the circle.
- If you can think of at least one, then you can use the word “*some*.”

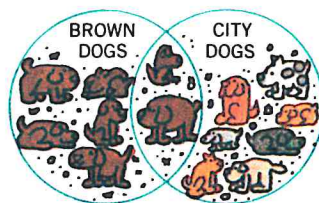


B. True or false? Tell why.

- All cats are black.
- No cats are black.
- Some cats are black.

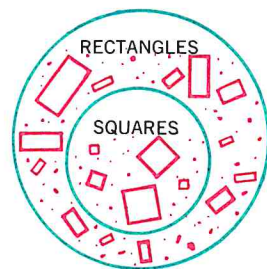
C. What do you think the circle diagram below shows?
Is each of the following sentences true or false? Tell why.

- All brown dogs live in the city.
- Some brown dogs live in the city.
- No brown dogs live in the city.
- Some city dogs are brown.
- No city dog is brown.



D. Which sentences does this circle diagram show?

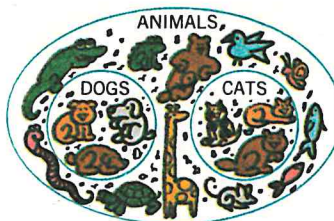
- All squares are rectangles.
- No squares are rectangles.
- Some rectangles are squares.
- All rectangles are squares.
- No rectangles are squares.



EXERCISES

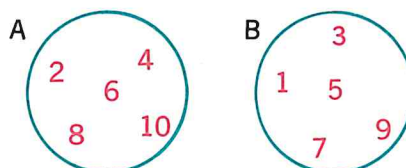
Write *True* or *False*.

- *1. All dogs are animals.
- 2. All animals are dogs.
- 3. Some animals are cats.
- 4. Some dogs are cats.



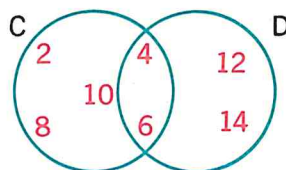
Write *True* or *False*.

- 5. No number in A is in B.
- *6. Some number in A is in B.
- 7. All numbers in A are in B.
- 8. A is a subset of B.



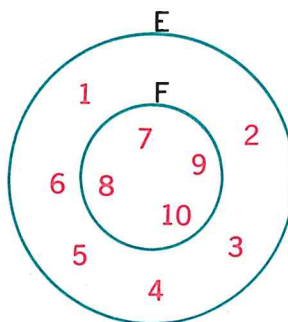
Write *True* or *False*.

- *9. Some number in C is in D.
- 10. No number in D is in C.
- 11. All numbers in C are in D.
- 12. C is a subset of D.



Write *True* or *False*.

- 13. All the whole numbers from 1 through 10 are inside the larger circle E.
- 14. There are 10 numbers in E.
- 15. Set F has 4 members.
- 16. All numbers in F are in E.
- 17. All numbers in E are in F.
- 18. Some numbers in F are in E.
- 19. Some numbers in E are in F.
- 20. F is a subset of E.

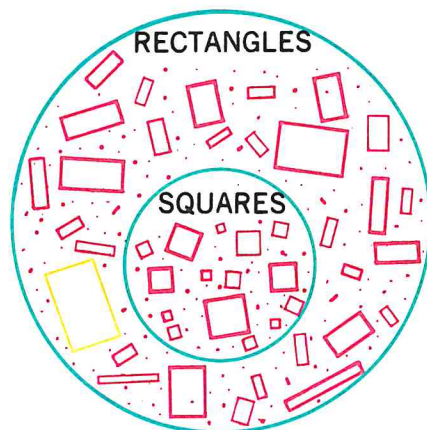


* 1. True. 6. False. 9. True.

IF-THEN SENTENCES

- A.** This sentence is true:
All squares are rectangles.
You can tell the same idea another way.
If a figure is a square,
then the figure is a rectangle.

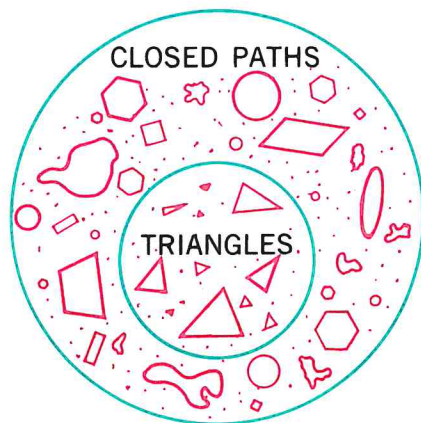
- Point to a square in the diagram. Is this square also a rectangle?



- B.** Point to the yellow rectangle in the diagram above.
Is this rectangle also a square?
- The following sentence is *not true*. Why not?
If a figure is a rectangle, then the figure is a square.

- C.** The diagram shows that this sentence is true:
All triangles are closed paths.
Which sentence below tells the same idea?

- *If a figure is a triangle,*
then it is a closed path.
- *If a figure is a closed path,*
then it is a triangle.

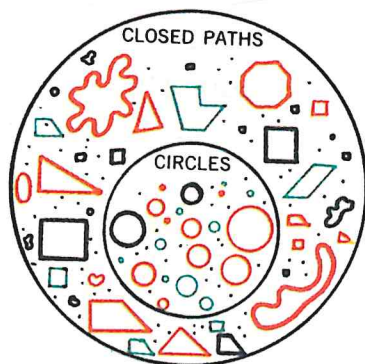


- D.** This sentence is true:
All squares are closed paths.
- What *If-then* sentence tells the same idea?

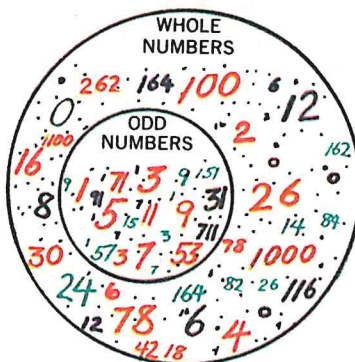
EXERCISES

Write one true sentence using the word *All*. Then write one true *If-then* sentence that tells the same idea.

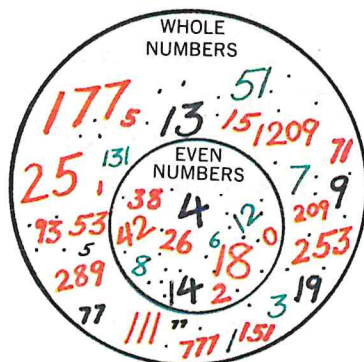
1.



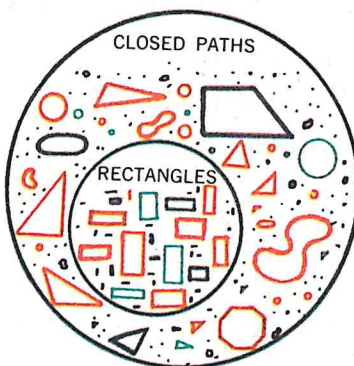
2.



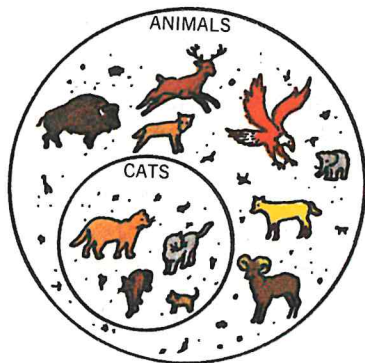
3.



4.



5.



6.



WHAT CAN YOU CONCLUDE?

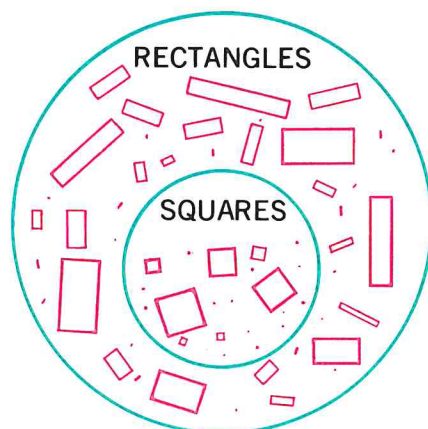
A. These two sentences are true.

All squares are rectangles.

Figure ABCD is a square.

Which of the following sentences is true?

- *Therefore, figure ABCD is a rectangle.*
- *Therefore, figure ABCD is not a rectangle.*



B. The two sentences at the left are true.

Which sentence at the right is true?

- | | |
|--|---|
| <ul style="list-style-type: none">■ If a figure is a square, then it is a rectangle.Figure <i>ABCD</i> is a square. | <ul style="list-style-type: none">a. Therefore, figure <i>ABCD</i> is a rectangle.b. Therefore, figure <i>ABCD</i> is not a rectangle. |
|--|---|

C. The first two sentences are true. What can you conclude?

- All even numbers are whole numbers.
The number 2 is an even number.
Therefore, _____?
- If a number is an odd number, then it is a whole number.
The number 3 is an odd number.
Therefore, _____?
- If a toy is a rubber ball, then it will bounce.
This toy is a rubber ball.
Therefore, _____?

EXERCISES

The two sentences at the left are true.

Which sentence at the right is true?

- | | |
|---|--|
| 1. All triangles have 3 sides.
Figure ABC is a triangle. | a. Therefore, figure ABC has 3 sides.
b. Therefore, figure ABC does not have 3 sides. |
| 2. If a figure is a square,
then it has 4 sides.
Figure $ABCD$ is a square. | a. Therefore, figure $ABCD$ has more than 4 sides.
b. Therefore, figure $ABCD$ has 4 sides. |

The first two sentences in each exercise are true.

What can you conclude?

- All rectangles are closed paths.
Figure $PQRS$ is a rectangle.
Therefore, _____.
- If a figure is a rectangle, then it is a closed path.
Figure $ABCD$ is a rectangle.
Therefore, _____.
- If a figure is a circle, then it is round.
Figure A is a circle.
Therefore, _____.
- All cats have 4 legs.
Tabby is a cat.
Therefore, _____.
- All cars have wheels.
A station wagon is a car.
Therefore, _____.

CHECKPOINT

✓ Check your understanding of **key terms**.

Use each in a sentence.

all

some

✓ Check your understanding of **key ideas**.

1a. Is 3×264 about 600
or about 900?

1b. How do you estimate a
product?

2a. Complete the sentence.
 $(2 \times 156) =$
 $(2 \times \underline{\quad}) + (2 \times \underline{\quad}) + (2 \times \underline{\quad})$

2b. How do you use
the distributive property
to multiply?

3a. Do you need to rename?
Write Yes or No.

$$2 \times 463$$

$$2 \times 467$$

$$3 \times 741$$

$$3 \times 731$$

3b. When do you need to
rename ones?

When do you need to
rename tens?

✓ Check your **skills**.

Find the answers.

1. $3 \times 400 = n$

2. $4 \times 200 = n$

3. $5 \times 600 = n$

4. $3 \times (400 + 20 + 5) = n$

5. $2 \times (200 + 30 + 4) = n$

6.
$$\begin{array}{r} 64 \\ \times 3 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 34 \\ \times 5 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 28 \\ \times 2 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 57 \\ \times 3 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 69 \\ \times 2 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 427 \\ \times 5 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 438 \\ \times 3 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 742 \\ \times 3 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 363 \\ \times 3 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 309 \\ \times 5 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 204 \\ \times 5 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 430 \\ \times 4 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 240 \\ \times 2 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 477 \\ \times 5 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 365 \\ \times 5 \\ \hline \end{array}$$

UNIT TEST

Find the answers.

1. Is 5×375 closer to 1500 or to 2000?

2. The first two sentences are true.

What can you conclude?

All dogs have two ears.

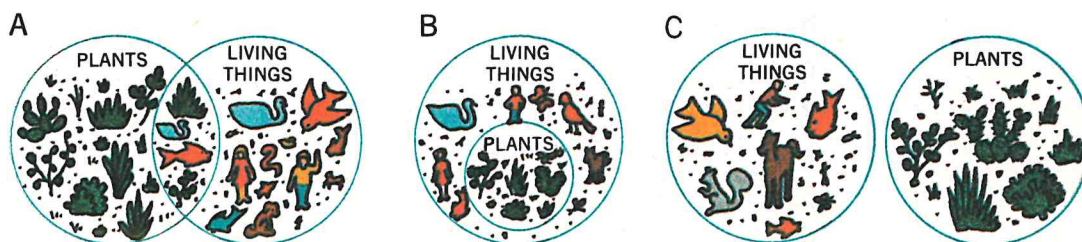
Fido is a dog.

a. Fido does not have two ears.

b. Fido has two ears.



3. Which diagram shows that "All plants are living things?"



Copy and complete.

4. $3 \times (294) = (\underline{\quad} \times 200) + (3 \times 90) + (3 \times \underline{\quad})$

Find the products.

5.
$$\begin{array}{r} 37 \\ \times 5 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 205 \\ \times 6 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 400 \\ \times 2 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 721 \\ \times 5 \\ \hline \end{array}$$

9.
$$\begin{array}{r} \$8.49 \\ \times 3 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 763 \\ \times 2 \\ \hline \end{array}$$

If you have time, try these.

11. $5 \times 50 = 250$, so $5 \times 49 = \underline{\quad}$

12. $3 \times 50 = 150$, so $3 \times 51 = \underline{\quad}$

INQUIRY INTO NUMBER

How Many Pairs?

Look at the chart shown below. As you read from top to bottom, the sums appear in a pattern.

- Can you tell what that pattern is?

NUMBER SENTENCE	NUMBER OF PAIRS OF WHOLE NUMBERS
a. $\square + \triangle = 0$	1
b. $\square + \triangle = 1$	<u>?</u>
c. $\square + \triangle = 2$	<u>?</u>
d. $\square + \triangle = 3$	<u>?</u>
e. $\square + \triangle = 4$	<u>?</u>
f. $\square + \triangle = 5$	<u>?</u>
g. $\square + \triangle = 6$	<u>?</u>
h. $\square + \triangle = 7$	<u>?</u>
i. $\square + \triangle = 8$	<u>?</u>
j. $\square + \triangle = 9$	<u>?</u>

- One pair of whole numbers makes sentence **a** true.
What is the pair of whole numbers?
- How many different pairs of whole numbers make sentence **b** true?
How many different pairs of whole numbers make sentence **c** true?
How many different pairs of whole numbers make sentence **d** true?
- Can you tell quickly, without listing them, how many different pairs of whole numbers make each of the other sentences true? If not, do the exercises on the next page. Look for a pattern.

FINDING THE PATTERN

Make a table for each number sentence **a** through **d**.
List the pairs of numbers that make each sentence true.

a. $\square + \triangle = 0$ **b.** $\square + \triangle = 1$ **c.** $\square + \triangle = 2$ **d.** $\square + \triangle = 3$

\square	\triangle
0	0

\square	\triangle
0	1
1	?

\square	\triangle
0	2
1	?
2	?

\square	\triangle
0	?
1	?
2	?
3	?

- How many different pairs make sentence **a** true?
sentence **b**? sentence **c**? sentence **d**?
What do you think the pattern is?
- Guess how many pairs make sentence **e** true.
Check your guess by listing the pairs.
- Use the pattern to tell how many different pairs make each of the other sentences true.

For Further Inquiry

Look at the tables you made for each sentence.

- Cross off one of the two pairs that have the same numbers, but show them in opposite order.

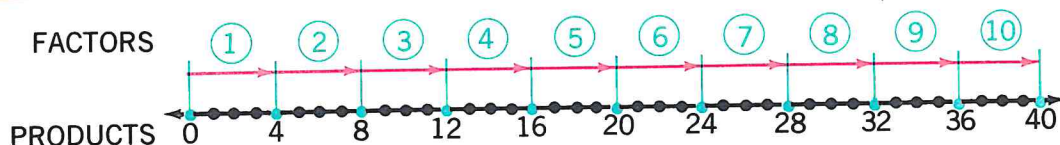
Example: **b.** $\square + \triangle = 1$

\square	\triangle
0	1
1	0

Cross off 1, 0 because it is just the opposite of 0, 1.

- Look for another pattern. Then tell quickly how many pairs make each sentence true if you do not count the opposites.

EXPLORING WITH 4 AS A FACTOR



A. Use the number line to count by 4's to 40.

{4, 8, 12, , , , , , , 40}

- You have named some products with 4 as a factor. These products are also **multiples** of 4.
- Which multiples of 4 are between 0 and 10?
between 10 and 20? between 20 and 30?
between 30 and 40?
- Which multiples of 4 are also multiples of 10?

B. Count by 4's another way on the number line. Use the factors. They tell how many 4's are counted. Begin this way: "One four is four. Two fours is eight."

- How many 4's are between 0 and 10?
between 10 and 20? between 20 and 30?
between 30 and 40?
How many 4's is 20? is 40? is 0?

C. Find n . Use the number line if you need to.

$$\begin{array}{l} 3 \text{ fours} = n \\ 3 \times 4 = n \end{array}$$

$$\begin{array}{l} 6 \text{ fours} = n \\ 6 \times 4 = n \end{array}$$

$$\begin{array}{l} 7 \text{ fours} = n \\ 7 \times 4 = n \end{array}$$

$$\begin{array}{l} 8 \text{ fours} = n \\ 8 \times 4 = n \end{array}$$

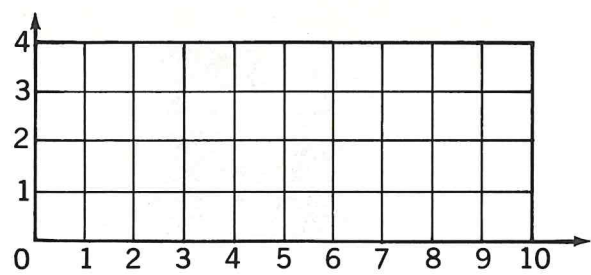
$$\begin{array}{l} n \text{ fours} = 8 \\ n \times 4 = 8 \\ 8 \div 4 = n \end{array}$$

$$\begin{array}{l} n \text{ fours} = 16 \\ n \times 4 = 16 \\ 16 \div 4 = n \end{array}$$

$$\begin{array}{l} n \text{ fours} = 20 \\ n \times 4 = 20 \\ 20 \div 4 = n \end{array}$$

$$\begin{array}{l} n \text{ fours} = 36 \\ n \times 4 = 36 \\ 36 \div 4 = n \end{array}$$

EXERCISES



Find n . If you need help, count the square regions by fours or use the number line on the opposite page.

- *1. 2 fours = n
 $2 \times 4 = n$

4. 5 fours = n
 $5 \times 4 = n$

7. 8 fours = n
 $8 \times 4 = n$

10. $8 = n$ fours
 $8 = n \times 4$
 $8 \div 4 = n$

13. $32 = n \times 4$
 $32 \div 4 = n$

16. $28 = n \times 4$
 $28 \div 4 = n$

2. 3 fours = n
 $3 \times 4 = n$

5. 6 fours = n
 $6 \times 4 = n$

8. 9 fours = n
 $9 \times 4 = n$

11. $16 = n$ fours
 $16 = n \times 4$
 $16 \div 4 = n$

14. $12 = n \times 4$
 $12 \div 4 = n$

17. $36 = n \times 4$
 $36 \div 4 = n$

3. 4 fours = n
 $4 \times 4 = n$

6. 7 fours = n
 $7 \times 4 = n$

9. 0 fours = n
 $0 \times 4 = n$

12. $24 = n$ fours
 $24 = n \times 4$
 $24 \div 4 = n$

15. $20 = n \times 4$
 $20 \div 4 = n$

18. $4 = n \times 4$
 $4 \div 4 = n$

Write two multiplication and two division sentences for each number family.

19. {4, 7, 28}
20. {4, 5, 20}
21. {8, 4, 32}
22. {9, 4, 36}

Use the picture above for Ex. 23–28. Find the number of square regions needed to cover a rectangular region 4 units tall and

23. 3 units long.

24. 5 units long.

25. 7 units long.
26. 9 units long.

27. 4 units long.

28. 6 units long.

* 1. 8; 8 10. 2; 2; 2 19. $4 \times 7 = 28$; $7 \times 4 = 28$; $28 \div 4 = 7$; $28 \div 7 = 4$ 23. 12 square units.

MULTIPLICATION WITH 4 AS A FACTOR

One dollar is
worth 4 quarters.
How many quarters
can you get for \$2?
for \$4? for \$6?



A. Read the table below. Begin by saying: "Zero times four is zero. One times four is four."

Multiplication facts with 4 as a factor									
4	4	4	4	4	4	4	4	4	4
$\times 0$	$\times 1$	$\times 2$	$\times 3$	$\times 4$	$\times 5$	$\times 6$	$\times 7$	$\times 8$	$\times 9$
<u>0</u>	<u>4</u>	<u>8</u>	<u>12</u>	<u>16</u>	<u>20</u>	<u>24</u>	<u>28</u>	<u>32</u>	<u>36</u>
0	1	2	3	4	5	6	7	8	9
$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$
<u>0</u>	<u>4</u>	<u>8</u>	<u>12</u>	<u>16</u>	<u>20</u>	<u>24</u>	<u>28</u>	<u>32</u>	<u>36</u>

EXERCISES

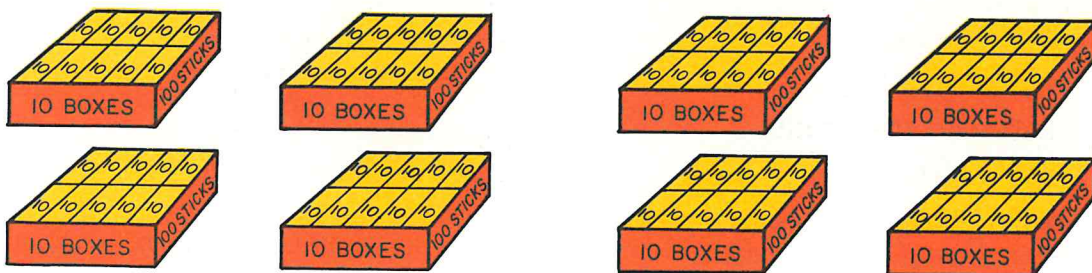
Practice until you can write every answer correctly.

- | | | | | | |
|---|---|---|--|--|--|
| 1. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$ | 2. $\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$ | 3. $\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$ | 4. $\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$ | 5. $\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$ | 6. $\begin{array}{r} 1 \\ \times 4 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$ | 8. $\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$ | 9. $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$ | 10. $\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$ | 11. $\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$ | 12. $\begin{array}{r} 4 \\ \times 0 \\ \hline \end{array}$ |

Write only the final answer.

13. Think of each answer in Ex. 1–6 and add 2 to it.
14. Think of each answer to Ex. 7–12 and add 3 to it.

USING A BASIC FACT



A. Think of 2 sets of 4 cartons of chalk.

■ $2 \times 4 = 8$

■ There are ? cartons.

B. Think of each carton having 10 boxes.

■ 2×4 tens = 8 tens, so $2 \times 40 = \underline{\quad ? \quad}$

■ There are ? boxes.

C. Think of each carton having 100 sticks of chalk.

■ 2×4 hundreds = ?, so $2 \times 400 = \underline{\quad ? \quad}$

■ There are ? sticks of chalk.

✓ $3 \times 4 = 12$, so 3×4 tens = ?

$3 \times 40 = \underline{\quad ? \quad}$

$3 \times 4 = 12$, so 3×4 hundreds = ?

$3 \times 400 = \underline{\quad ? \quad}$

EXERCISES

Find the product.

*1. $\begin{array}{r} 20 \\ \times 4 \\ \hline \end{array}$

2. $\begin{array}{r} 30 \\ \times 4 \\ \hline \end{array}$

3. $\begin{array}{r} 90 \\ \times 4 \\ \hline \end{array}$

4. $\begin{array}{r} 60 \\ \times 4 \\ \hline \end{array}$

5. $\begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$

*6. $\begin{array}{r} 400 \\ \times 4 \\ \hline \end{array}$

7. $\begin{array}{r} 500 \\ \times 4 \\ \hline \end{array}$

8. $\begin{array}{r} 700 \\ \times 4 \\ \hline \end{array}$

9. $\begin{array}{r} 200 \\ \times 4 \\ \hline \end{array}$

10. $\begin{array}{r} 800 \\ \times 4 \\ \hline \end{array}$

* 1. 80 6. 1600

USING 4 IN MULTIPLICATION

- A.** You can use the facts with 4 to estimate the product.

$$4 \times 765$$

- Why is 3200 a better estimate than 2800?

Estimate: $4 \times 800 = 3200$
 $4 \times 765 = \square$
 $4 \times 700 = 2800$

4×765 is about 3200

- B.** Copy and complete the example.

- How does your answer compare with the estimate?

Example: $\begin{array}{r} 22 \\ 765 \\ \times 4 \\ \hline ? ? ? 0 \end{array}$

EXERCISES

Write an estimate first. Then multiply to find the product.

*1. $\begin{array}{r} 24 \\ \times 4 \\ \hline \end{array}$

2. $\begin{array}{r} 13 \\ \times 4 \\ \hline \end{array}$

3. $\begin{array}{r} 48 \\ \times 3 \\ \hline \end{array}$

4. $\begin{array}{r} 46 \\ \times 5 \\ \hline \end{array}$

5. $\begin{array}{r} 24 \\ \times 7 \\ \hline \end{array}$

6. $\begin{array}{r} 900 \\ \times 4 \\ \hline \end{array}$

7. $\begin{array}{r} 420 \\ \times 3 \\ \hline \end{array}$

8. $\begin{array}{r} 734 \\ \times 4 \\ \hline \end{array}$

9. $\begin{array}{r} 208 \\ \times 4 \\ \hline \end{array}$

10. $\begin{array}{r} 816 \\ \times 4 \\ \hline \end{array}$

*11. $\begin{array}{r} \$.41 \\ \times 4 \\ \hline \end{array}$

12. $\begin{array}{r} \$.94 \\ \times 4 \\ \hline \end{array}$

13. $\begin{array}{r} \$.04 \\ \times 4 \\ \hline \end{array}$

14. $\begin{array}{r} \$ 72 \\ \times 4 \\ \hline \end{array}$

15. $\begin{array}{r} \$ 47 \\ \times 4 \\ \hline \end{array}$

16. $\begin{array}{r} \$ 1.15 \\ \times 4 \\ \hline \end{array}$

17. $\begin{array}{r} \$ 6.28 \\ \times 4 \\ \hline \end{array}$

18. $\begin{array}{r} \$ 3.00 \\ \times 4 \\ \hline \end{array}$

19. $\begin{array}{r} \$ 2.17 \\ \times 4 \\ \hline \end{array}$

20. $\begin{array}{r} \$ 9.04 \\ \times 4 \\ \hline \end{array}$

Complete each to make a true sentence.

- * 21. 4 yards make ? feet. 22. 4 feet make ? inches.
 23. 4 yards make ? inches. 24. 4 meters make ? centimeters.

* 1. 80; 96

11. \$1.60; \$1.64

21. 12

MULTIPLICATION PRACTICE

Find each product.

*1. $4 \times 7 = 28$

$4 \times 70 = ?$

$4 \times 700 = ?$

2. $4 \times 9 = 36$

$4 \times 90 = ?$

$4 \times 900 = ?$

3. $4 \times 4 = 16$

$4 \times 40 = ?$

$4 \times 400 = ?$

4. $3 \times 5 = ?$

$3 \times 50 = ?$

$3 \times 500 = ?$

5. $2 \times 6 = ?$

$2 \times 60 = ?$

$2 \times 600 = ?$

6. $0 \times 1 = ?$

$0 \times 10 = ?$

$0 \times 100 = ?$

*7.
$$\begin{array}{r} 12 \\ \times 3 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 54 \\ \times 2 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 41 \\ \times 5 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 93 \\ \times 3 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 24 \\ \times 2 \\ \hline \end{array}$$

*12.
$$\begin{array}{r} 16 \\ \times 4 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 57 \\ \times 3 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 45 \\ \times 8 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 27 \\ \times 5 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 43 \\ \times 9 \\ \hline \end{array}$$

*17.
$$\begin{array}{r} 428 \\ \times 3 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 126 \\ \times 2 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 319 \\ \times 4 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 216 \\ \times 4 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 537 \\ \times 2 \\ \hline \end{array}$$

*22.
$$\begin{array}{r} 121 \\ \times 7 \\ \hline \end{array}$$

23.
$$\begin{array}{r} 283 \\ \times 2 \\ \hline \end{array}$$

24.
$$\begin{array}{r} 472 \\ \times 4 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 691 \\ \times 5 \\ \hline \end{array}$$

26.
$$\begin{array}{r} 764 \\ \times 2 \\ \hline \end{array}$$

27.
$$\begin{array}{r} 308 \\ \times 3 \\ \hline \end{array}$$

28.
$$\begin{array}{r} 570 \\ \times 2 \\ \hline \end{array}$$

29.
$$\begin{array}{r} 220 \\ \times 9 \\ \hline \end{array}$$

30.
$$\begin{array}{r} 804 \\ \times 4 \\ \hline \end{array}$$

31.
$$\begin{array}{r} 106 \\ \times 5 \\ \hline \end{array}$$

32.
$$\begin{array}{r} \$.22 \\ \times 5 \\ \hline \end{array}$$

33.
$$\begin{array}{r} \$.25 \\ \times 9 \\ \hline \end{array}$$

34.
$$\begin{array}{r} \$.54 \\ \times 4 \\ \hline \end{array}$$

35.
$$\begin{array}{r} \$.21 \\ \times 3 \\ \hline \end{array}$$

36.
$$\begin{array}{r} \$.43 \\ \times 4 \\ \hline \end{array}$$

37.
$$\begin{array}{r} \$2.26 \\ \times 2 \\ \hline \end{array}$$

38.
$$\begin{array}{r} \$3.31 \\ \times 6 \\ \hline \end{array}$$

39.
$$\begin{array}{r} \$8.26 \\ \times 4 \\ \hline \end{array}$$

40.
$$\begin{array}{r} \$7.14 \\ \times 3 \\ \hline \end{array}$$

41.
$$\begin{array}{r} \$4.50 \\ \times 5 \\ \hline \end{array}$$

*1. 280; 2800

7. 36

12. 64

17. 1284

22. 847

27. 924

32. \$1.10

37. \$4.52

DIVIDING BY 4



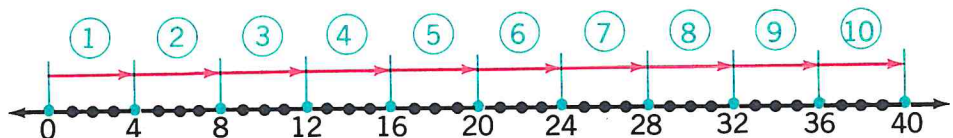
A. Mr. Jones makes a pattern block using 4 bricks. He has 28 bricks. How many pattern blocks can he make?

- You can think:
4 bricks make a pattern block.
How many 4's make 28?
- Count by 4's to find out.
 $\underline{\quad} \text{ fours} = 28$
 $\underline{\quad} \times 4 = 28$

B. You can write $28 \div 4 = n$ to find how many 4's make 28.

- Since $7 \times 4 = 28$, then $28 \div 4 = \underline{\quad}$.
- 28 bricks make $\underline{\quad}$ blocks with 4 bricks in each block.

C. You can use a number line to help you divide.



- Count the arrows.
 $\underline{\quad} \times 4 = 24$
 $24 \div 4 = \underline{\quad}$

✓ Find n .

$$\begin{array}{|l} n \times 4 = 8 \\ 8 \div 4 = n \end{array}$$

$$\begin{array}{|l} n \times 4 = 20 \\ 20 \div 4 = n \end{array}$$

$$\begin{array}{|l} n \times 4 = 32 \\ 32 \div 4 = n \end{array}$$

$$\begin{array}{|l} n \times 4 = 36 \\ 36 \div 4 = n \end{array}$$

EXERCISES

Find n . Use the given number sentence to help you.

*1. $3 \times 4 = 12$

$12 \div 4 = n$

4. $1 \times 4 = 4$

$4 \div 4 = n$

7. $4 \times 7 = 28$

$28 \div 7 = n$

10. $32 \div 4 = 8$

$36 \div 4 = n$

2. $4 \times 4 = 16$

$16 \div 4 = n$

5. $6 \times 4 = 24$

$24 \div 4 = n$

8. $20 \div 4 = 5$

$24 \div 4 = n$

11. $32 \div 4 = 8$

$28 \div 4 = n$

3. $10 \times 4 = 40$

$40 \div 4 = n$

6. $6 \times 4 = 24$

$24 \div 6 = n$

9. $40 \div 4 = 10$

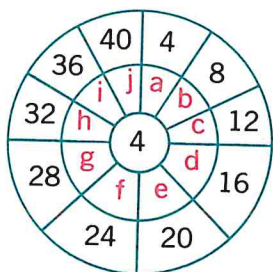
$36 \div 4 = n$

12. $4 \div 4 = 1$

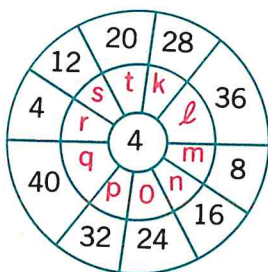
$0 \div 4 = n$

Name the missing factors.

13.



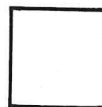
14.



Find the answer.

15. It takes 4 congruent segments to make a square.

How many separate squares like the one shown can you make for 16 congruent segments?



16. The pieces of wood make a rectangle. How many separate rectangles can you make from 10 short pieces of wood and 10 long pieces of wood?



Think Twice

17. Can you use 12 segments congruent to \overline{AB} to make 5 squares? (*Hint: Not all of the squares will be the same size.*)



DIVISION FACTS WITH 4 AS A FACTOR

- A.** Read the division facts in this table.
Begin by saying, "Zero equals how many fours? Zero."
Four equals how many fours? One."

Division facts with 4 as a factor									
0	1	2	3	4	5	6	7	8	9
$4 \overline{)0}$	$4 \overline{)4}$	$4 \overline{)8}$	$4 \overline{)12}$	$4 \overline{)16}$	$4 \overline{)20}$	$4 \overline{)24}$	$4 \overline{)28}$	$4 \overline{)32}$	$4 \overline{)36}$
	4	4	4	4	4	4	4	4	4
	$1 \overline{)4}$	$2 \overline{)8}$	$3 \overline{)12}$	$4 \overline{)16}$	$5 \overline{)20}$	$6 \overline{)24}$	$7 \overline{)28}$	$8 \overline{)32}$	$9 \overline{)36}$

- B.** Now read the facts another way. Begin: "Zero divided by four equals zero. Four divided by four equals one."

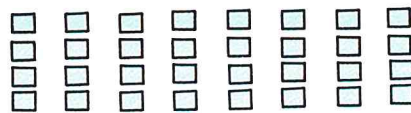
EXERCISES

Practice until you can write every answer correctly.

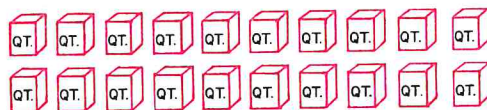
- $4 \overline{)8}$
- $4 \overline{)16}$
- $4 \overline{)24}$
- $4 \overline{)36}$
- $8 \overline{)32}$
- $1 \overline{)4}$
- $7 \overline{)28}$
- $5 \overline{)20}$
- $4 \overline{)0}$
- $3 \overline{)12}$
- $4 \overline{)4}$
- $6 \overline{)24}$
- $2 \overline{)8}$
- $4 \overline{)28}$
- $9 \overline{)36}$

Use the picture to help solve the problem.

16. 4 ice cubes fill a glass.
32 ice cubes used.
? glasses filled.



17. 4 quarts make a gallon.
20 quarts.
? gallons.



KEEPING UP IN MATHEMATICS

How many line segments make up each figure below?

Name each figure. [86-87]

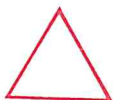
1.



2.



3.



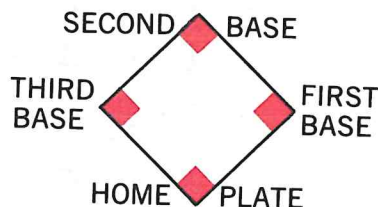
4.



Think of a line segment drawn from home plate to second base.

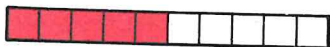
What part of the baseball diamond is each triangular-shaped piece? [94-95]

5.



What fraction names the part of each figure that is in color? [94-95]

6.



7.



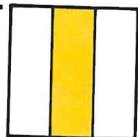
8.



9.



10.



Solve using the greatest number you can for n . [154-58, 192, 200]

11. $n \times 4 < 35$

12. $n \times 5 < 14$

13. $n \times 3 < 23$

14. $n \times 2 < 19$

15. $n \times 10 < 67$

Replace \bullet with $<$ or $>$ to make each sentence true. [28]

16. $26 \bullet 62$

17. $3 + 7 \bullet 5$

18. $16 - 8 \bullet 12 - 3$

19. $41 - 20 \bullet 41 + 20$

20. $8 \times 4 \bullet 8 \times 40$

21. $25 \times 3 \bullet 52 \times 3$

22. $35 \div 5 \bullet 32 \div 4$

23. $27 \div 3 \bullet 25 \div 5$

Solve. [178-81]

24. $0 \times 685 = n$

25. $1 \times 752 = n$

26. $6 \times 943 = 943 \times n$

Complete each sentence. [260]

27. $3 \times 16 = 48$, so

$3 \times \$0.16 = \underline{\hspace{1cm}}$

28. $4 \times 34 = 136$, so

$4 \times \$0.34 = \underline{\hspace{1cm}}$

29. $5 \times 79 = 395$, so

$5 \times \$0.79 = \underline{\hspace{1cm}}$

30. $2 \times 56 = 112$, so

$2 \times \$0.56 = \underline{\hspace{1cm}}$

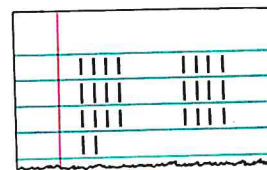
THE GREATEST NUMBER OF FOURS

Mr. Smith makes tables. Each has 4 legs.
How many tables can be made with 26 legs?



A. Make a mark for each leg.

- How many 4's do you get?
How many are left over?
- 26 is 6 fours and 2 left over.
 $26 = (\underline{\quad} \times 4) + \underline{\quad}$
- Mr. Smith can make $\underline{\quad}$ tables, and have $\underline{\quad}$ legs left over.



B. Use the chart to find the greatest number of 4's in 13 and the remainder.

- Count the first 13 circles.
There are 3 rows of 4 circles and $\underline{\quad}$ circle left over.
- $13 = (3 \times 4) + \underline{\quad}$
- Find q .
 $17 = (q \times 4) + 1 \quad 29 = (q \times 4) + 1$

✓ Tell the greatest number of 4's and the remainder for the whole numbers 1 through 40.

1	2	3	4	1
5	6	7	8	2
9	10	11	12	3
13	14	15	16	4
17	18	19	20	5
21	22	23	24	6
25	26	27	28	7
29	30	31	32	8
33	34	35	36	9
37	38	39	40	10

EXERCISES

Find q . If you need help, use the chart.

- * 1. $9 = (q \times 4) + 1$
- 3. $12 = (q \times 4) + 0$
- 5. $21 = (q \times 4) + 1$
- 7. $30 = (q \times 4) + 2$

- 2. $11 = (q \times 4) + 3$
- 4. $14 = (q \times 4) + 2$
- 6. $24 = (q \times 4) + 0$
- 8. $33 = (q \times 4) + 1$

* 1. 2

Find r . If you need help, use the chart.

*9. $7 = (1 \times 4) + r$

10. $10 = (2 \times 4) + r$

11. $13 = (3 \times 4) + r$

12. $15 = (3 \times 4) + r$

13. $22 = (5 \times 4) + r$

14. $26 = (6 \times 4) + r$

15. $30 = (7 \times 4) + r$

16. $34 = (8 \times 4) + r$

17. $38 = (9 \times 4) + r$

18. $29 = (7 \times 4) + r$

If q is the greatest whole number of 4's, find q . Then find r .

*19. $15 = (q \times 4) + r$

20. $19 = (q \times 4) + r$

21. $23 = (q \times 4) + r$

22. $27 = (q \times 4) + r$

23. $31 = (q \times 4) + r$

24. $35 = (q \times 4) + r$

25. $39 = (q \times 4) + r$

26. $40 = (q \times 4) + r$

Use multiplication facts you know to find the greatest whole number for Δ . Try to do these without looking at the chart.

Then check yourself using the chart.

*27. $\Delta \times 4 < 27$

28. $\Delta \times 4 < 15$

29. $\Delta \times 4 < 1$

30. $\Delta \times 4 < 38$

31. $\Delta \times 4 < 35$

32. $\Delta \times 4 < 18$

33. $\Delta \times 4 < 9$

34. $\Delta \times 4 < 25$

35. $\Delta \times 4 < 6$

36. $\Delta \times 4 < 21$

37. $\Delta \times 4 < 30$

38. $\Delta \times 4 < 34$

39. $\Delta \times 4 < 39$

40. $\Delta \times 4 < 3$

41. $\Delta \times 4 < 11$

Solve.

*42. $4 \overline{)23}$

43. $4 \overline{)37}$

44. $4 \overline{)21}$

45. $4 \overline{)10}$

46. $4 \overline{)35}$

47. $4 \overline{)26}$

48. $4 \overline{)19}$

49. $4 \overline{)14}$

50. $4 \overline{)22}$

51. $4 \overline{)33}$

Think Twice

52. What whole numbers from 0 through 50 have a remainder of 1 when you divide by 4? Which leave a remainder of 2? of 3? of 0?

* 9. 3 19. 3; 3 27. 6 42. 5r3

TWO USES OF DIVISION

- A.** Rita had 24 ice cubes. She put 4 ice cubes in each glass. How many glasses did she use?

■ $\underline{\quad} \times 4 = 24$

$24 \div 4 = \underline{\quad}$

- She used $\underline{\quad}$ glasses.

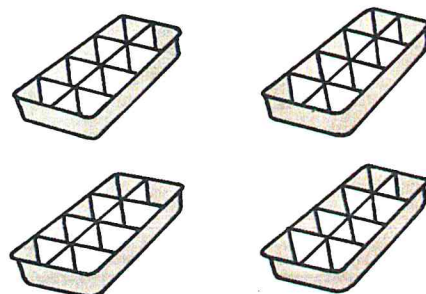


- B.** Rita is filling 4 ice trays with water. They will make 32 ice cubes. How many cubes will each tray make?

■ $4 \times \underline{\quad} = 32$

$32 \div 4 = \underline{\quad}$

- Each tray will make $\underline{\quad}$ cubes.



EXERCISES

Solve each problem. Write a number sentence if it helps you.

1. You have 36 cards. You deal them out into 4 equal piles. How many cards are in each pile?



2. Sally separated 24 marbles by color. She had 6 marbles of each color. How many different colors did she have?

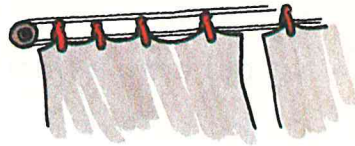


3. You need 20 paper cups. There are 5 cups in a package. How many packages do you need?



Solve. Write the answer only.

4. It takes 4 clothes pins to hang one sheet. How many sheets can you hang with 16 clothes pins?



5. You put 4 pennies into a parking meter to get one hour of time. How many hours would you get for 8 pennies?



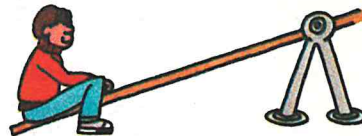
6. Vinny drinks 28 glasses of milk in 7 days. He drinks the same amount each day. How many glasses of milk does he drink each day?



7. Each of 4 benches seats the same number of persons. There are 20 people sitting on the benches. How many are on each bench?



8. There are 12 children playing on 6 seesaws. The same number are on each. How many children are on each seesaw?



9. There are 12 bears in the zoo. The same number of bears are in each cage. There are 4 bear cages. How many bears are in each?



10. A crew of workers can build 1 story of a building in a week. At this rate how many weeks will it take to build 4 stories?



MULTIPLICATION AND DIVISION FACTS TEST

Write the answers only.

	a	b	c	d	e	f	g	h	i
1.	$\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$
2.	$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$
3.	$\begin{array}{r} 1 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$
4.	$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 0 \\ \hline \end{array}$
5.	$\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 6 \\ \hline \end{array}$
6.	$\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$
7.	$3 \overline{)3}$	$2 \overline{)18}$	$4 \overline{)20}$	$5 \overline{)45}$	$4 \overline{)24}$	$2 \overline{)12}$	$4 \overline{)32}$	$3 \overline{)24}$	$2 \overline{)4}$
8.	$6 \overline{)30}$	$3 \overline{)27}$	$5 \overline{)40}$	$6 \overline{)24}$	$4 \overline{)8}$	$3 \overline{)9}$	$2 \overline{)6}$	$5 \overline{)10}$	$2 \overline{)10}$
9.	$4 \overline{)28}$	$5 \overline{)30}$	$2 \overline{)8}$	$7 \overline{)28}$	$3 \overline{)15}$	$9 \overline{)27}$	$5 \overline{)20}$	$7 \overline{)7}$	$4 \overline{)36}$
10.	$5 \overline{)25}$	$7 \overline{)35}$	$2 \overline{)0}$	$4 \overline{)12}$	$7 \overline{)14}$	$5 \overline{)5}$	$8 \overline{)40}$	$3 \overline{)21}$	$3 \overline{)18}$
11.	$6 \overline{)6}$	$2 \overline{)14}$	$4 \overline{)16}$	$5 \overline{)35}$	$9 \overline{)45}$	$7 \overline{)21}$	$8 \overline{)24}$	$2 \overline{)16}$	$9 \overline{)18}$
12.	$3 \overline{)6}$	$3 \overline{)12}$	$6 \overline{)18}$	$6 \overline{)12}$	$5 \overline{)15}$	$8 \overline{)32}$	$9 \overline{)9}$	$9 \overline{)36}$	$1 \overline{)8}$

WHAT IS THE OPERATION?

Addition, subtraction, multiplication, and division are the basic **operations** of arithmetic.

A. The four number sentences at the right show four different operations.

■ Name the operation that is shown by each sentence.

$$10 + 5 = 15$$

$$10 - 5 = 5$$

$$10 \times 5 = 50$$

$$10 \div 5 = 2$$

EXERCISES

Replace ● with +, −, ×, or ÷ to make the sentence true.

*1. $6 \bullet 3 = 9$

2. $3 \bullet 1 = 2$

3. $6 \bullet 3 = 2$

4. $3 \bullet 0 = 3$

5. $2 \bullet 5 = 10$

6. $2 \bullet 5 = 7$

7. $5 \bullet 2 = 3$

8. $10 \bullet 2 = 5$

9. $8 \bullet 4 = 2$

10. $2 \bullet 4 = 8$

11. $8 \bullet 4 = 4$

12. $4 \bullet 8 = 12$

List the numbers that make each sentence true.

13. The whole numbers for \triangle that will make $10 - \triangle$ a whole number.

14. The counting numbers less than 51 that make $\triangle \div 5$ a whole number with a remainder of 0.

Write *One* or *All* to tell whether each sentence is true for just one whole number or for all whole numbers.

*15. $\triangle + 0 = \triangle$

16. $\square \times 1 = \square$

17. $\triangle \div 1 = \triangle$

18. $14 = \square \times (5 + 2)$

19. $\triangle \times 5 = 30$

20. $40 \div 5 = \square$

21. $\triangle - 0 = \triangle$

22. $\square \times 8 = 8 \times \square$

23. $\triangle \times 0 = 0$

* 1. + 15. All.

TAKE A SPIN

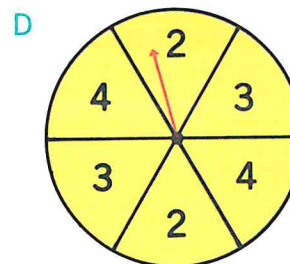
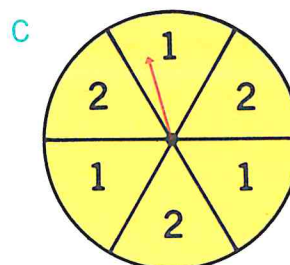
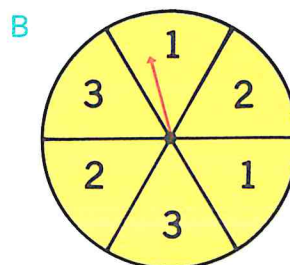
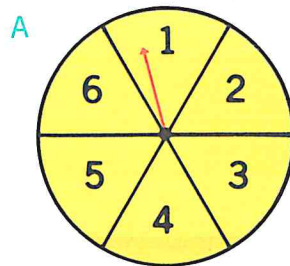
Jim, Sally, and Willie are playing a board game. The number of spaces they can move will be shown by the pointer on each spinner.

- A.** Willie wanted to make a move of 5 spaces.
- Should he use spinner A or spinner B? Why?

- B.** Jim and Sally both wanted to move 2 spaces. Jim used spinner C and got a 2. Sally used spinner D and got a 3.

- In ten turns, would Jim *probably* get 2 more often or less often than Sally?
- Are you more likely to get 2 if you use spinner C or spinner D? Why?

- C.** On Willie's next turn he wanted to move 1 space. He can use spinner A, B, C, or D.
- Which should he choose? Why?



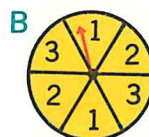
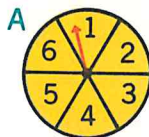
EXERCISES

Which spinner from each pair would you choose so that you are more likely to get a 1?

*1.



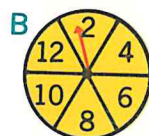
2.



3.

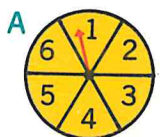


4.



Which spinner in each pair would you use to get a 3? If you think the chances of getting a 3 are the same, write *Either*.

5.



6.



7.



8.



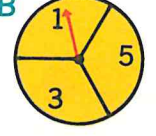
9.



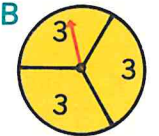
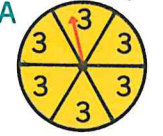
10.



11.



12.

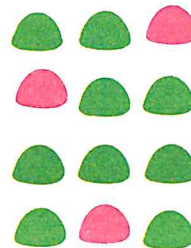


* 1. A

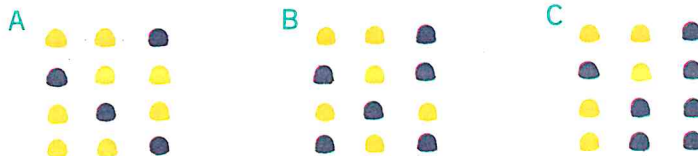
PROBABILITY

A. Are there more red gumdrops or more green gumdrops?

- Suppose you pick a gumdrop without looking.
What color gumdrop are you more likely to get?
- How likely you are to get a certain color is called the **probability** of getting the color.
- Why is the probability of getting a green gumdrop greater than the probability of getting a red one.
- Could you get a red one?

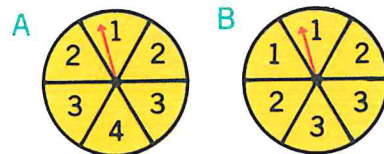


B. Suppose you want to get a purple gumdrop.
From which set would you pick? Why?

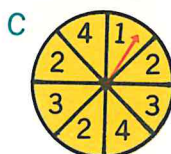


- In which set is the probability of picking a purple gumdrop less than the probability of picking a yellow gumdrop? Why?
- In which set is the probability of picking a purple one equal to the probability of picking a yellow one? Why are the probabilities equal?

- ✓ Which spinner would you use if you wanted to get a 1? Why?
Which spinner would you use if you wanted to get a 2? Why?



EXERCISES



Choose the spinner that answers the question.

- *1. On which spinner is the probability of getting a 1 less than the probability of getting a 2?
2. On which spinner is the probability of getting a 1 equal to the probability of getting a 2?
3. On which spinner is the probability of getting a 1 greater than the probability of getting a 2?
4. Which spinner would you use if you wanted a 1? a 2? a 3?

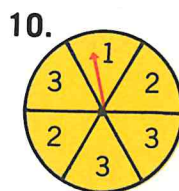
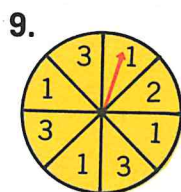
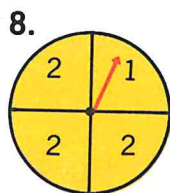
Compare the probability of picking the first color with the probability of picking the second color.

Write *Equal* or *Not equal*.

5. Blue or red.
6. Red or yellow.
7. Blue or yellow.



Which number are you most likely to get on each spinner?
Which number are you least likely to get?



* 1. C

CHECKPOINT

✓ Check your understanding of **key terms**.

Use each in a sentence.

multiple

operations

probability

✓ Check your understanding of **key ideas**.

1a. $6 \times 4 = 24$

$6 \times 40 = ?$

$6 \times 400 = ?$

1b. How do you use basic facts to help you multiply?

2a. Is 4×187 about 400 or about 800?

2b. How do you estimate a product?

3a. A doll says either “mommy” or “daddy” when you pull a string. You pull the string. Is the probability of the doll saying “mommy” less than, equal to, or greater than the probability of it saying “daddy”?

3b. There is a spinner with 1’s and 2’s. When is the probability of getting a 1 less than the probability of getting a 2? When is the probability equal? When is the probability greater?

✓ Check your **skills**.

1.
$$\begin{array}{r} 46 \\ \times 4 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 82 \\ \times 4 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 75 \\ \times 4 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 96 \\ \times 4 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 31 \\ \times 4 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 300 \\ \times 4 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 305 \\ \times 4 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 639 \\ \times 4 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 816 \\ \times 4 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 724 \\ \times 4 \\ \hline \end{array}$$

11. $4 \overline{)36}$

12. $4 \overline{)24}$

13. $4 \overline{)32}$

14. $4 \overline{)16}$

15. $4 \overline{)12}$

16. $4 \overline{)13}$

17. $4 \overline{)21}$

18. $4 \overline{)10}$

19. $4 \overline{)26}$

20. $4 \overline{)39}$

UNIT TEST

What is the greatest whole number that makes each sentence true?

1. $n \times 4 < 30$

2. $37 = (q \times 4) + 1$

Find the answers.

3. The library has 16 tables. Each table has 4 chairs.

Which number sentence below can you use to find how many chairs there are?

a. $4 \times n = 16$

b. $16 \times 4 = n$

4. If you use the spinner at the right are you more likely to get a 1 or a 2?



Find the products.

5.
$$\begin{array}{r} 490 \\ \times 4 \\ \hline \end{array}$$

6.
$$\begin{array}{r} \$1.32 \\ \times 4 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 658 \\ \times 4 \\ \hline \end{array}$$

Find the quotients and remainders.

8. $4 \overline{)24}$

9. $4 \overline{)15}$

10. $4 \overline{)0}$

If you have time, try these.

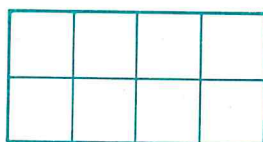
Solve.

11. $(4 \times 7) + 3 = n$

12. $(4 \times 8) - 1 = n$

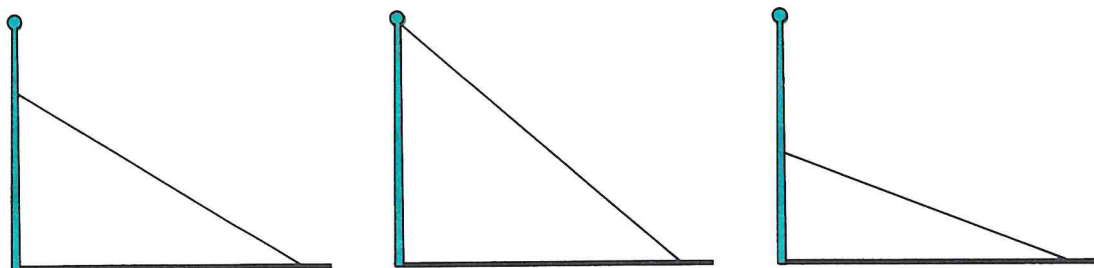
MATHAMUSEMENTS

How can you see 11 squares in this figure?



INQUIRY INTO GEOMETRY

Angles

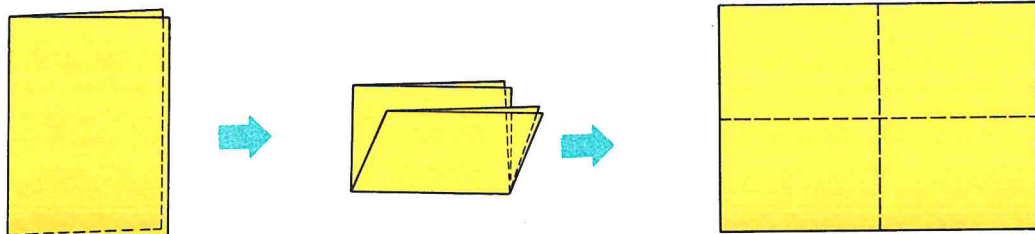


The wire and the shadow of the pole form an **angle**.

- If you raise the wire, do you get a larger or a smaller angle?
- If you lower the wire, do you get a larger or a smaller angle?

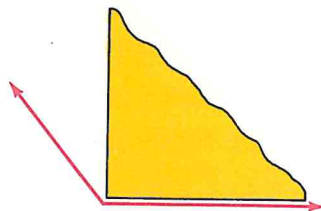
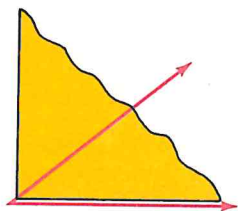
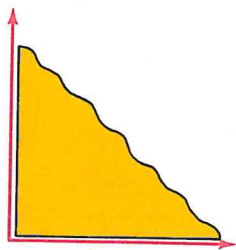
A RIGHT ANGLE

Can you fold a sheet of paper to make an angle like the one made by the pole and its shadow? If you cannot, read these steps.



- Fold a piece of paper. Crease it.
- Fold it again so the edges meet. Crease it.
- Unfold it. What do you see?
- Think of the two lines made by the creases. Do you see 4 angles? Are they the same size? Each angle is called a **right angle**.

COMPARING ANGLES



- Model fits.
Angle is a right angle.
- Model covers.
Angle is smaller than a right angle.
- Model does not fit or cover.
Angle is larger than a right angle.

- Find a right angle in the picture of the pole.
Is the angle made by the wire and the shadow larger or smaller than a right angle?
- Fold another sheet of paper to get an angle smaller than a right angle; larger than a right angle.
- Which angles below are smaller than a right angle?
equal to a right angle? larger than a right angle?

a.



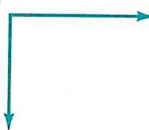
b.



c.



d.



e.



f.



g.



h.

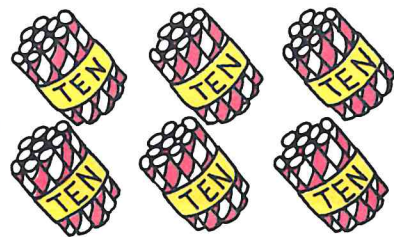


For Further Inquiry

You measure an angle using a unit called a **degree**. It takes 90 units to make one right angle. The measure of a right angle is 90° . Fold a sheet of paper to get an angle of 45° .

DIVIDING TENS

- A.** Bob and Barb want to share the packs of candy equally.
How many packs will each get?



- Since 6 packs are to be put into 2 equivalent sets, you can divide.
 $6 \div 2 = \underline{\quad}$ 6 packs $\div 2 = \underline{\quad}$ packs.
- Bob gets 3 packs and Barb gets $\underline{\quad}$ packs.

- B.** Suppose each pack contains 10 candies.
Since $6 \div 2 = 3$, then 6 tens $\div 2 = \underline{\quad}$ tens. $60 \div 2 = \underline{\quad}$

- Bob would get 30 and Barb would get $\underline{\quad}$ pieces of candy.

- C.** How are these two ways to show division alike? different?

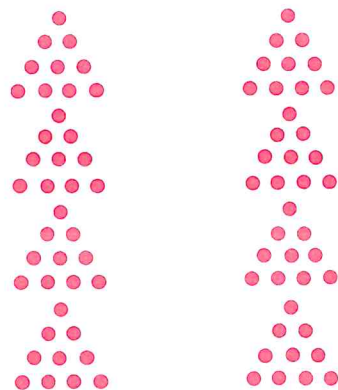
$$60 \div 2 = 30 \qquad \begin{array}{r} 30 \\ 2 \overline{)60} \end{array}$$

- You can check division using multiplication.

$$\text{Check: } 30 \times 2 = 60$$

- D.** Complete each sentence. Check your answers.

- $2 \div 2 = \underline{\quad}$, so
2 tens $\div 2 = \underline{\quad}$ ten
 $20 \div 2 = \underline{\quad}$
- $4 \div 2 = \underline{\quad}$, so
4 tens $\div 2 = \underline{\quad}$ tens
 $40 \div 2 = \underline{\quad}$
- $6 \div 2 = \underline{\quad}$, so
6 tens $\div 2 = \underline{\quad}$ tens
 $60 \div 2 = \underline{\quad}$
- $8 \div 2 = \underline{\quad}$, so
8 tens $\div 2 = \underline{\quad}$ tens
 $80 \div 2 = \underline{\quad}$



EXERCISES

Complete each division using the given number sentences.

*1. $8 \div 4 = 2$

$8 \text{ tens} \div 4 = \underline{\quad} \text{ tens}$

$80 \div 4 = \underline{\quad}$

??

$4 \overline{)80}$

*3. $15 \div 5 = 3$

$15 \text{ tens} \div 5 = \underline{\quad} \text{ tens}$

$150 \div 5 = \underline{\quad}$

??

$5 \overline{)150}$

2. $4 \div 2 = 2$

$4 \text{ tens} \div 2 = \underline{\quad} \text{ tens}$

$40 \div 2 = \underline{\quad}$

??

$2 \overline{)40}$

4. $20 \div 4 = 5$

$20 \text{ tens} \div 4 = \underline{\quad} \text{ tens}$

$200 \div 4 = \underline{\quad}$

??

$4 \overline{)200}$

To solve $160 \div 2 = n$
you can think: \longrightarrow

160 is 16 tens

$16 \div 2 = 8$, so $160 \div 2 = 80$

Solve.

*5. $40 \div 2 = n$

6. $120 \div 2 = n$

7. $140 \div 2 = n$

8. $60 \div 3 = n$

9. $120 \div 3 = n$

10. $150 \div 3 = n$

11. $180 \div 3 = n$

12. $210 \div 3 = n$

13. $270 \div 3 = n$

14. $120 \div 4 = n$

15. $160 \div 4 = n$

16. $200 \div 4 = n$

17. $240 \div 4 = n$

18. $280 \div 4 = n$

19. $320 \div 4 = n$

20. $50 \div 5 = n$

21. $100 \div 5 = n$

22. $150 \div 5 = n$

23. $200 \div 5 = n$

24. $250 \div 5 = n$

25. $300 \div 5 = n$

26. $350 \div 5 = n$

27. $400 \div 5 = n$

28. $450 \div 5 = n$

Copy and divide.

29. $2 \overline{)60}$

30. $7 \overline{)140}$

31. $2 \overline{)40}$

32. $2 \overline{)180}$

33. $3 \overline{)30}$

34. $3 \overline{)270}$

35. $4 \overline{)80}$

36. $2 \overline{)120}$

37. $3 \overline{)240}$

38. $4 \overline{)360}$

39. $3 \overline{)180}$

40. $5 \overline{)200}$

41. $4 \overline{)200}$

42. $5 \overline{)300}$

43. $4 \overline{)160}$

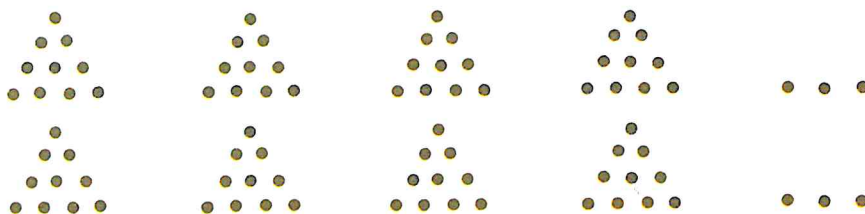
*1. 2; 20; 20

3. 3; 30; 30

5. 20

29. 30

DIVIDING TENS AND ONES



Shown above are 8 piles of ten pebbles and 6 single pebbles. They are separated into 2 equivalent sets. Can you tell how many are in each set?

A. You can use division to find the number in each set. How are the two examples below alike? different?

$$\begin{aligned} \text{a. } (8 \text{ tens} + 6) \div 2 &= (8 \text{ tens} \div 2) + (6 \div 2) \\ &= 4 \text{ tens} + 3 \\ &= 43 \end{aligned}$$

$$\begin{aligned} \text{b. } (80 + 6) \div 2 &= (80 \div 2) + (6 \div 2) \\ &= 40 + 3 \\ &= 43 \end{aligned}$$

■ After you divide the tens and then divide the ones, do you add or do you subtract the answers?

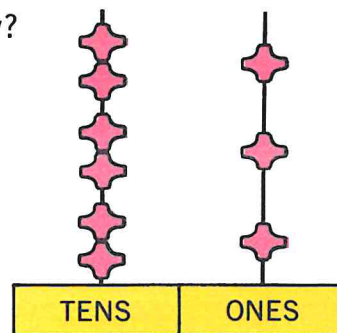
B. The abacus can help you divide tens and ones by 3.

■ What number does the abacus show?
Think of the number as 6 tens + 3.

■ Divide the tens by 3.
 $6 \text{ tens} \div 3 = \underline{\quad} \text{ tens}$

■ Divide the ones by 3.
 $3 \div 3 = 1$

■ Add the answers.
 $63 \div 3 = 20 + 1, \text{ or } \underline{\quad}$



EXERCISES

Complete each sentence.

- *1. $(4 \text{ tens} + 8) \div 4 = (\underline{\quad} \text{ tens} \div 4) + (8 \div 4)$
2. $(40 + 8) \div 4 = (\underline{\quad} \div 4) + (8 \div 4)$
3. $(20 \text{ tens} + 8) \div 4 = (20 \text{ tens} \div 4) + (\underline{\quad} \div 4)$
4. $(200 + 8) \div 4 = (200 \div 4) + (\underline{\quad} \div 4)$
- *5. $(6 \text{ tens} \div 3) + (9 \div 3) = \underline{\quad} \text{ tens} + 3 = \underline{\quad}$
6. $(60 \div 3) + (9 \div 3) = \underline{\quad} + 3 = \underline{\quad}$
7. $(15 \text{ tens} \div 5) + (5 \div 5) = 3 \text{ tens} + \underline{\quad} = \underline{\quad}$
8. $(150 \div 5) + (5 \div 5) = 30 + \underline{\quad} = \underline{\quad}$

Replace \bullet with the correct symbol.

- *9. $(60 + 2) \div 2 = (60 \div 2) \bullet (2 \div 2)$
10. $(90 + 6) \div 2 = (90 \div 2) \bullet (6 \div 2)$
11. $(100 + 4) \div 2 = (100 \div 2) \bullet (4 \div 2)$
12. $(400 + 5) \div 5 = (400 \div 5) \bullet (5 \div 5)$

Complete each sentence.

13. $(8 \text{ tens} + 4) \div 4 = (\underline{\quad} \text{ tens} \div 4) + (4 \div 4)$
 $= \underline{\quad} \text{ tens} + 1$
 $= \underline{\quad}$
14. $(20 \text{ tens} + 8) \div 4 = (20 \text{ tens} \div 4) + (\underline{\quad} \div 4)$
 $= \underline{\quad} \text{ tens} + \underline{\quad}$
 $= \underline{\quad}$
15. $36 \div 3 = (30 + 6) \div 3 = (30 \div 3) + (6 \div \underline{\quad}) = 10 + \underline{\quad} = \underline{\quad}$
16. $64 \div 2 = (60 + 4) \div 2 = (60 \div \underline{\quad}) + (4 \div 2) = \underline{\quad} + \underline{\quad} = \underline{\quad}$
17. $455 \div 5 = (450 + 5) \div 5 = (\underline{\quad} \div 5) + (5 \div 5) = \underline{\quad} + \underline{\quad} = \underline{\quad}$
18. $48 \div 4 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
19. $39 \div 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
20. $82 \div 2 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
21. $96 \div 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
22. $123 \div 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
23. $355 \div 5 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
24. $276 \div 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
25. $249 \div 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

*1. 4 5. 2; 23 9. + 15. 3; 2; 12 18. 10; 2; 12

TWO WAYS TO SHOW DIVISION

A. You can divide 84 by 2 using number sentences.

- Rename 84. $84 = 80 + 4$
- Divide 80 by 2. $(80 + 4) \div 2 = (80 \div 2) + (4 \div 2)$
- Divide 4 by 2. $= 40 + 2$
- Then add the answers. $= 42$

B. You can also divide 84 by 2 this way.

$\begin{array}{r} 40 \\ 2 \overline{)84} \end{array}$	➡	$\begin{array}{r} 2 \\ 2 \overline{)84} \end{array}$	➡	$\begin{array}{r} 42 \\ 2 \overline{)84} \end{array}$
<p>Divide the tens. $80 \div 2 = 40$ Write 40 above the 84.</p>		<p>Divide the ones. $4 \div 2 = 2$ Write 2 above the 0 in 40.</p>		<p>Add. $40 + 2 = 42$ Draw a line and write the answer 42.</p>

C. Your answer shows that $84 \div 2$ is 42.

Multiply to check the answer.

$$42 \times 2 = \underline{\quad}$$

- Is your answer correct?

✓ Use the number sentences to help find the missing digits.

$\begin{array}{rcl} 63 \div 3 & = & (60 \div 3) + (3 \div 3) \\ & = & 20 + 1 \\ & = & 21 \end{array}$	$\begin{array}{r} ?? \\ 1 \\ 20 \\ 3 \overline{)63} \end{array}$
---	--

$\begin{array}{rcl} 128 \div 4 & = & (120 \div 4) + (8 \div 4) \\ & = & 30 + 2 \\ & = & 32 \end{array}$	$\begin{array}{r} ?? \\ 2 \\ ?0 \\ 4 \overline{)128} \end{array}$
---	---

EXERCISES

Copy and complete.

2

?

?

20

1. 4)

84

?

?

?

?

?

?

?

?

2

6

2

?

4

4

?

0

2. 2)

48

?

?

?

?

?

?

?

?

?

?

?

2

104

3

?

?

30

3. 4)

124

?

?

?

?

?

?

?

?

?

?

?

3

6

?

?

?

?

?

4. 2)

168

?

?

?

?

?

?

?

?

?

?

?

9

369

Find each quotient.

*9. 3)

39

13. 2)

82

17. 3)

276

21. 5)

255

10. 3)

96

14. 2)

28

18. 3)

129

22. 4)

204

11. 2)

86

15. 4)

48

19. 5)

355

23. 3)

216

12. 4)

44

16. 3)

63

20. 2)

168

24. 2)

146

Find each answer.

25. $84 \div 2 = n$

28. $126 \div 3 = n$

31. $188 \div 2 = n$

26. $69 \div 3 = n$

29. $183 \div 3 = n$

32. $166 \div 2 = n$

27. $368 \div 4 = n$

30. $246 \div 3 = n$

33. $144 \div 2 = n$

34. There are 3 servings in a can of soup.
How many cans are needed for 18 servings?
for 24? 30? 63? 96?



35. There are 2 children in a pair.
How many pairs can be made with 106 children? 128? 142?

DIVIDING TO SHOW MONEY

A. Fred must share \$1.28 equally with his sister Cindy.
To find how much money each gets, Fred divides.

■ Fred thinks: \$1.28 is the same as 128 cents.



■ Fred remembers to write the dollar sign and cents point in the answer.

✓ Copy and complete.

$$\begin{array}{r} 62 \\ 2 \\ 60 \\ 3 \overline{)186} \end{array}$$

$$\begin{array}{r} \$.\overline{??} \\ ? \\ 60 \\ 3 \overline{)1.86} \end{array}$$

$$\begin{array}{r} ?? \\ 1 \\ 50 \\ 4 \overline{)204} \end{array}$$

$$\begin{array}{r} \$.\overline{??} \\ ? \\ ?? \\ 4 \overline{)2.04} \end{array}$$

EXERCISES

Copy and divide.

* 1. $2 \overline{)\$.40}$

2. $2 \overline{)\$.46}$

3. $4 \overline{)\$.48}$

4. $3 \overline{)\$.96}$

* 5. $3 \overline{)\$ 2.76}$

6. $5 \overline{)\$ 3.50}$

7. $5 \overline{)\$ 1.55}$

8. $2 \overline{)\$ 1.46}$

9. $4 \overline{)\$.84}$

10. $6 \overline{)\$ 3.00}$

11. $2 \overline{)\$ 1.68}$

12. $5 \overline{)\$ 4.00}$

13. $3 \overline{)\$ 1.80}$

14. $3 \overline{)\$ 1.56}$

15. $2 \overline{)\$.86}$

16. $4 \overline{)\$ 2.00}$

* 1. \$.20 5. \$.92

ESTIMATING ANSWERS

- A.** Andy and Bill share \$.58.
They share the money equally.
Can you tell about how much each boy will get?



- You are asked to estimate the answer.
- \$.58 is the same as ? cents.
- Since 58 to the nearest ten is 60, you can think $60 \div 2 = ?$.
- Does each boy get about \$.20, about \$.30, or about \$.40?

EXERCISES

Estimate to find which answer is most sensible.

- * 1. Dotty bought 3 bars of soap.
The soap cost \$.19 a bar.
Did Dotty spend about \$.40, \$.60, or \$2.00?
2. A rain coat costs \$5.98.
Boots cost \$3.50.
Will both cost about \$6.00, \$8.00, or \$10.00?
3. A ball costs \$.49.
Craig pays for it with a dollar.
Will his change be about \$.40, \$.50, or \$.60?
4. One yard of rope costs \$.21.
Will 5 yards of rope cost about \$2.00, \$1.00, or \$1.50?
5. Susan buys 4 comic books.
She spends \$.84.
Did each book cost about \$.20, \$.30, or \$.40?



* 1. \$.60

KEEPING UP IN MATHEMATICS

Copy and complete. [32-33]

1. 9 tens = ?
2. 7 tens = ?
3. 9 tens + 7 tens = ? tens
4. $90 + 70 = \underline{\quad}$
5. 8 hundreds = ?
6. 6 hundreds = ?
7. 8 hundreds - 6 hundreds = ?
8. $800 - 600 = \underline{\quad}$

Solve. [44-45]

9. $3 + 2 + 7 = n$
10. $6 + 3 + 5 = n$
11. $8 + 1 + 4 = n$
12. $4 + 5 + 6 = n$
13. $9 + 8 + 7 = n$

Rename each. [114-15]

14. $87 = \underline{\quad}$ tens 7 ones
15. $95 = 8$ tens ? ones
16. $75 = 6$ tens ? ones
17. $83 = \underline{\quad}$ tens 13 ones

Find the answers. [6, 40, 68]

- | | |
|--|--|
| 18. $\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$ | 19. $\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$ |
| 20. $\begin{array}{r} 24 \\ +13 \\ \hline \end{array}$ | 21. $\begin{array}{r} 15 \\ +8 \\ \hline \end{array}$ |
| 22. $\begin{array}{r} 59 \\ +23 \\ \hline \end{array}$ | 23. $\begin{array}{r} 75 \\ +69 \\ \hline \end{array}$ |

Find the answers. [11, 42, 116-25]

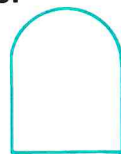
- | | |
|---|--|
| 24. $\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$ | 25. $\begin{array}{r} 28 \\ -17 \\ \hline \end{array}$ |
| 26. $\begin{array}{r} 53 \\ -49 \\ \hline \end{array}$ | 27. $\begin{array}{r} 521 \\ -134 \\ \hline \end{array}$ |
| 28. $\begin{array}{r} 102 \\ -36 \\ \hline \end{array}$ | 29. $\begin{array}{r} 700 \\ -268 \\ \hline \end{array}$ |

What numbers are named by these Roman numerals? [105]

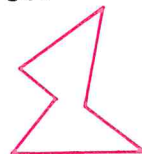
- | | | |
|---------|--------|---------|
| 30. III | 31. VI | 32. X |
| 33. IV | 34. IX | 35. VII |

Which figures have line symmetry? [224-25]

36.



37.

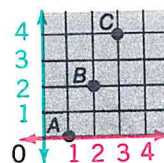


38.



Write a number pair for each point on the grid. [236-37]

39.



PRACTICE IN MULTIPLYING AND DIVIDING

Find each answer.

1. $\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$

2. $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$

3. $\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$

4. $\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$

5. $\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$

6. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$

7. $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$

8. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$

9. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$

10. $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$

11. $\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$

12. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$

13. $5 \overline{)42}$

14. $5 \overline{)4}$

15. $4 \overline{)22}$

16. $3 \overline{)23}$

17. $6 \overline{)30}$

18. $5 \overline{)32}$

19. $4 \overline{)11}$

20. $5 \overline{)38}$

21. $3 \overline{)27}$

22. $5 \overline{)10}$

23. $4 \overline{)37}$

24. $2 \overline{)9}$

25. $5 \overline{)25}$

26. $9 \overline{)47}$

27. $5 \overline{)15}$

28. $4 \overline{)12}$

29. $5 \overline{)28}$

30. $6 \overline{)24}$

31. $2 \overline{)17}$

32. $5 \overline{)29}$

33. $3 \overline{)13}$

34. $8 \overline{)40}$

35. $5 \overline{)20}$

36. $5 \overline{)8}$

37. $2 \overline{)14}$

38. $5 \overline{)49}$

39. $3 \overline{)18}$

40. $5 \overline{)48}$

41. $4 \overline{)33}$

42. $5 \overline{)7}$

43. $7 \overline{)35}$

44. $5 \overline{)44}$

45. $9 \overline{)36}$

46. $5 \overline{)47}$

47. $5 \overline{)43}$

48. $3 \overline{)28}$

Solve.

49. $45 \div 9 = n$

52. $5 \div 5 = n$

55. $10 \div 2 = n$

58. $18 \div 6 = n$

61. $27 \div 3 = n$

64. $40 \div 8 = n$

67. $9 \times 4 = n$

70. $5 \times 5 = n$

50. $21 \div 7 = n$

53. $15 \div 3 = n$

56. $32 \div 8 = n$

59. $36 \div 9 = n$

62. $16 \div 4 = n$

65. $2 \times 9 = n$

68. $5 \times 3 = n$

71. $5 \times 7 = n$

51. $30 \div 6 = n$

54. $20 \div 4 = n$

57. $36 \div 4 = n$

60. $5 \div 1 = n$

63. $16 \div 2 = n$

66. $6 \times 3 = n$

69. $2 \times 5 = n$

72. $2 \times 7 = n$

DIVIDING HUNDREDS

A. What division fact is used to divide 600 by 2?

- How does the check show 300 is the correct answer?

$$6 \div 2 = 3$$

$$6 \text{ hundreds} \div 2 = 3 \text{ hundreds}$$

$$600 \div 2 = 300$$

$$\text{Check: } 300 \times 2 = 600$$

B. How can you use $6 \div 2 = 3$ to help you divide 600 by 2 this way?

- In what place is the 6?
- In what place is the 3?
- Complete the check. Is 300 the correct answer?

$$\begin{array}{r} 300 \\ 2 \overline{)600} \end{array}$$

$$\text{Check: } 300 \times 2 = \underline{\quad}$$

EXERCISES

Solve.

*1. $8 \div 2 = 4$, so $8 \text{ hundreds} \div 2 = n \text{ hundreds}$

2. $800 \div 2 = n$

3. $15 \div 5 = 3$, so $15 \text{ hundreds} \div 5 = n \text{ hundreds}$

4. $1500 \div 5 = n$

*5. $3200 \div 4 = n$

6. $2700 \div 3 = n$

7. $1200 \div 4 = n$

8. $900 \div 3 = n$

9. $2500 \div 5 = n$

10. $1600 \div 4 = n$

11. $600 \div 2 = n$

12. $1800 \div 3 = n$

13. $3500 \div 5 = n$

Copy and divide. Then check your answer.

*14. $2 \overline{)800}$

15. $3 \overline{)600}$

16. $2 \overline{)1200}$

17. $5 \overline{)1500}$

18. $4 \overline{)1600}$

19. $3 \overline{)2100}$

20. $4 \overline{)2400}$

21. $4 \overline{)3200}$

22. $5 \overline{)4500}$

23. $5 \overline{)4000}$

* 1. 4

5. 800

14. 400; check: $400 \times 2 = 800$

DIVIDING HUNDREDS, TENS, AND ONES

A. Can you solve this number sentence? $648 \div 2 = n$
Explain how the sentences below can be used to find n .

$$\begin{aligned} 648 \div 2 &= (600 + 40 + 8) \div 2 \\ 648 \div 2 &= (600 \div 2) + (40 \div 2) + (8 \div 2) \\ 648 \div 2 &= \underbrace{300 + 20 + 4}_{324} \\ 648 \div 2 &= 324 \end{aligned}$$

- What number does n equal?

B. In the vertical example, you write the answers on top.

$(600 \div 2) + (40 \div 2) + (8 \div 2)$

$\begin{array}{r} 324 \\ 4 \overline{) 1296} \\ \underline{12} \\ 9 \\ 8 \\ \underline{8} \\ 0 \end{array}$

- In the vertical example, where do you write 300? Where do you write 20? Where do you write 4?

- What do you do with these numbers to find 324?

EXERCISES

Copy and find the answers.

$$*1. \quad 2 \overline{)486}$$

2. $3 \overline{)639}$

3. $4 \overline{)844}$

4. $4 \overline{) 208}$

5. $2 \overline{)826}$

6. $2 \overline{)408}$

$$7. \quad 2 \overline{) 640}$$

8. $3 \overline{)339}$

9. $2 \overline{)186}$

10. $3 \overline{)360}$

11. $5 \overline{)550}$

12. $4 \overline{)488}$

13. $2 \overline{)480}$

14. $2 \overline{)806}$

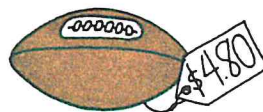
15. $2 \overline{)468}$

16. $2 \overline{)280}$

* 1. 243

USING DIVISION

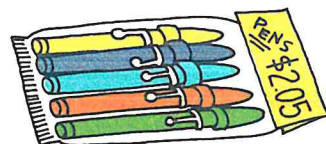
- A.** Walter and Fred are buying a football that costs \$4.80. They want to share the cost equally. Can you tell how much each should pay?



- Find this quotient.
 $480 \div 2 = \underline{\quad ? \quad}$
- Write a dollar sign and a cents point in the answer.

$$\begin{array}{r} \$2.40 \\ 40 \\ 200 \\ 2 \overline{) \$4.80} \end{array}$$

- B.** Ernie wants to buy a package of pens for \$2.05. The package has 5 pens. Can you tell how much each pen costs?



- You can estimate the answer first.
- Since 205 to the nearest hundred is 200, you can think $200 \div 5 = \underline{\quad ? \quad}$.
- Find the answer.
They cost $\underline{\quad ? \quad}$ cents each.

$$\begin{array}{r} \$.\text{??} \\ ? \\ 40 \\ 5 \overline{) \$2.05} \end{array}$$

EXERCISES

Suppose 2 friends want to share the costs of these items equally. How much should each pay?

- * 1. A baseball bat at \$4.68.
2. A punching bag at \$8.80.
3. A bow and arrows at \$2.60.
4. A doll house at \$6.20.
5. A sled at \$14.00.



* 1. \$2.34

Choose the best estimate.

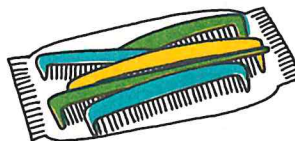
- *6. Roy buys a can of 3 balls for \$1.26.
Did each ball cost about 30¢, 40¢, or 50¢?

7. Jane buys 3 pairs of socks for \$1.00.
Did each pair cost about 30¢, 40¢, or 50¢?



8. A package of tarts costs 86¢.
Three children share the cost equally.
Will each child pay about 20¢, 30¢, or 40¢?

9. May bought a package of 5 combs.
It cost \$2.48.
Did each comb cost about 40¢, 50¢, or 60¢?



Copy and divide.

10. $3 \overline{) \$1.56}$

11. $4 \overline{) \$.48}$

12. $3 \overline{) \$2.13}$

13. $9 \overline{) \$2.70}$

14. $4 \overline{) \$1.64}$

15. $2 \overline{) \$1.86}$

16. $4 \overline{) \$2.48}$

17. $3 \overline{) \$1.59}$

18. $3 \overline{) \$6.33}$

19. $4 \overline{) \$3.20}$

20. $3 \overline{) \$1.89}$

21. $4 \overline{) \$2.88}$

22. $3 \overline{) \$3.66}$

23. $4 \overline{) \$1.20}$

24. $3 \overline{) \$.96}$

25. $4 \overline{) \$3.64}$

26. $8 \overline{) \$2.40}$

27. $6 \overline{) \$1.80}$

28. $7 \overline{) \$2.17}$

29. $3 \overline{) \$1.86}$

30. $4 \overline{) \$2.40}$

31. $5 \overline{) \$3.55}$

32. $4 \overline{) \$8.04}$

33. $3 \overline{) \$9.06}$

34. $2 \overline{) \$8.40}$

35. $3 \overline{) \$6.90}$

36. $4 \overline{) \$8.44}$

37. $5 \overline{) \$5.50}$

38. $2 \overline{) \$6.84}$

39. $4 \overline{) \$2.40}$

40. $2 \overline{) \$4.08}$

41. $5 \overline{) \$5.05}$

42. $3 \overline{) \$1.26}$

43. $2 \overline{) \$4.06}$

44. $2 \overline{) \$1.86}$

45. $6 \overline{) \$12.60}$

* 6. 40¢

PROBLEMS WITHOUT NUMBERS

Write *Add* or *Subtract* to tell how you would solve the problem.

1. You know how many boys and how many girls are in your class. To find the number of children in the class, you ? .



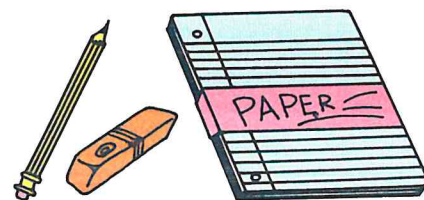
2. You know how old Polly is. You know how old Bob is. To find how much younger Polly is than Bob, you ? .

3. You know how much money James has. You know how much a pair of skates cost. To find how much more money James needs for the skates, you ? .



4. You know the cost of a large ball and the cost of a small ball. To find how much more one costs than the other, you ? .

5. You know the cost of a pencil, of an eraser, and of a package of paper. To find the cost of all these things, you ? .



6. You know how tall Wendy is. You know how tall Debbie is. To find how much taller Wendy is than Debbie, you ? .

Write *Multiply* or *Divide* to tell how you would solve the problem.

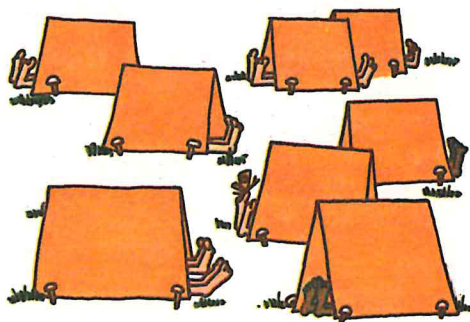
7. You know how many pegs are in a box.

You know how many pupils are in your class.

To find how many pegs each child can have, you ? .

8. You know how many boys are going on a camping trip.

You know how many tents they are taking. The same number of boys sleep in each tent. To find how many boys must sleep in each tent, you ? .



9. You know how many hamburgers were ordered.

You know the total cost.

To find how much each hamburger costs, you ? .

10. You know how much money you can save in a week.

You save the same amount each week. To find how much you can save in a year, you ? .



1. You know how many hours there are in a day.

To find how many hours there are in a week, you ? .

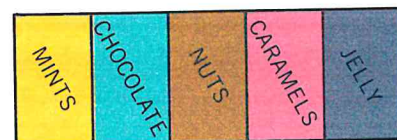
2. You know how many blocks Martin must walk to school

each day. To find how many blocks he walks in a week, you ? .



FRACTIONS AND SETS

- A.** This package is made up of 5 small boxes.
How many boxes have mint candies?



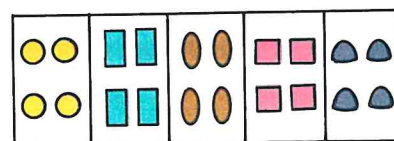
- The fraction $\frac{1}{5}$ shows 1 out of 5 boxes has mint.

The number $\frac{1}{5}$ shows the *part* of the package that has mint.

- Do you know the number of pieces that are mint?

- B.** Suppose there are 20 pieces of candy in the package.
Each of the 5 boxes has the same number of pieces.

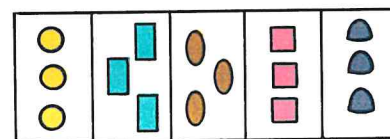
- Since 5 fours = 20, each box has 4 pieces.
1 box out of 5 boxes is 4 pieces out of 20 pieces.
- How many pieces are in 2 boxes?
2 out of 5 is ? out of 20.
- How many pieces are in 3 boxes?
3 out of 5 is ? out of 20.
- How many pieces are in 4 boxes?
4 out of 5 is ? out of 20.
- How many pieces are in 5 boxes?
5 out of 5 is ? out of 20.



$$\frac{1}{5} \text{ is } \frac{4}{20}$$

- ✓ Suppose there are 15 pieces in 5 boxes.

- Each box has ? pieces.
1 box out of 5 is ? pieces out of ?.
- 2 boxes have ? pieces.
2 boxes out of 5 is ? pieces out of ?.
- 5 boxes have ? pieces.
5 boxes out of 5 is ? pieces out of ?.

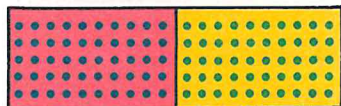
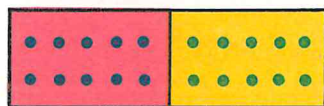
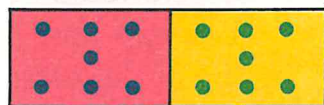
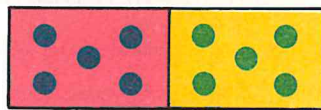


$$\frac{1}{5} \text{ is } \frac{3}{15}$$

EXERCISES

A package of candy has 2 boxes.
One box out of 2 is red.
Complete each sentence.

- *1. Suppose the package has 10 pieces in all.
1 box has ? pieces.
1 box out of 2 boxes is ? pieces out of 10 pieces.
2 out of 2 is ? out of 10.
2. Suppose the package has 14 pieces in all.
Each box has ? pieces.
1 box out of 2 is ? pieces out of 14.
2 out of 2 is 14 out of ?.
3. Suppose the package has 20 pieces in all.
1 out of 2 is ? out of 20.
2 out of 2 is ? out of 20.
4. Suppose there are 100 pieces in all.
Each box has ? pieces.
1 out of 2 is ? out of 100.
2 out of 2 is 100 out of ?.



The total number of pieces of candy in 2 boxes is shown.
Find the number of pieces in 1 box.

- | | | | | |
|--------|--------|--------|---------|---------|
| *5. 16 | 6. 20 | 7. 12 | 8. 18 | 9. 200 |
| 10. 40 | 11. 60 | 12. 80 | 13. 800 | 14. 400 |

The total number of pieces of candy in 4 boxes is shown.
Find the number of pieces in 1 box.

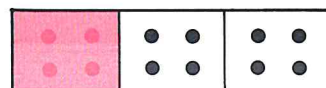
- | | | | | |
|--------|--------|--------|---------|---------|
| 15. 4 | 16. 8 | 17. 12 | 18. 16 | 19. 20 |
| 20. 32 | 21. 40 | 22. 80 | 23. 800 | 24. 200 |

* 1. 5; 5; 10 5. 8 15. 1

PARTS OF SETS

- A.** Suppose you know a fraction for part of a set.
 Suppose you know the total number of members in the set.
 Can you find the number of members in the part?

- $\frac{1}{3}$ of the set is red.
 The $\frac{1}{3}$ shows the part.
- Suppose there are 12 members in the set.
 Since 3 fours = 12,
 each part has ? members.
- One of the parts, or $\frac{1}{3}$, has 4 members.
- Two of the parts, or $\frac{2}{3}$, have ? members.
- Three of the parts, or $\frac{3}{3}$, have ? members.



EXERCISES

How many members are in each part?

There are 12 members in all.

- *1. $\frac{1}{4}$ 2. $\frac{2}{4}$
 3. $\frac{3}{4}$ 4. $\frac{4}{4}$



There are 10 members in all.

5. $\frac{1}{5}$ 6. $\frac{2}{5}$ 7. $\frac{3}{5}$
 8. $\frac{4}{5}$ 9. $\frac{5}{5}$



There are 15 members in all.

10. $\frac{1}{3}$ 11. $\frac{2}{3}$ 12. $\frac{3}{3}$



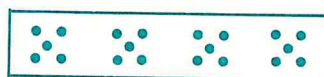
*1. 3

How many members are in each part?

There are 20 members in all.

13. $\frac{1}{4}$ 14. $\frac{2}{4}$

15. $\frac{3}{4}$ 16. $\frac{4}{4}$



There are 12 members in all.

17. $\frac{1}{6}$ 18. $\frac{2}{6}$ 19. $\frac{3}{6}$

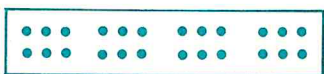
20. $\frac{4}{6}$ 21. $\frac{5}{6}$ 22. $\frac{6}{6}$



There are 24 members in all.

23. $\frac{1}{4}$ 24. $\frac{2}{4}$

25. $\frac{3}{4}$ 26. $\frac{4}{4}$



There are 30 members in all.

27. $\frac{1}{5}$ 28. $\frac{2}{5}$ 29. $\frac{3}{5}$

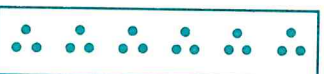
30. $\frac{4}{5}$ 31. $\frac{5}{5}$



There are 18 members in all.

32. $\frac{1}{6}$ 33. $\frac{2}{6}$ 34. $\frac{3}{6}$

35. $\frac{4}{6}$ 36. $\frac{5}{6}$ 37. $\frac{6}{6}$



There are 20 members in all.

38. $\frac{1}{10}$ 39. $\frac{2}{10}$

40. $\frac{3}{10}$ 41. $\frac{4}{10}$

42. $\frac{5}{10}$ 43. $\frac{6}{10}$

44. $\frac{7}{10}$ 45. $\frac{8}{10}$

46. $\frac{9}{10}$ 47. $\frac{10}{10}$



PRACTICE WITH FRACTIONS

Find each answer.

1. Angela baked 30 cookies.

She gave $\frac{1}{5}$ of them to Tony.

How many did she give to Tony?

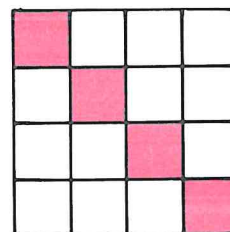
(Hint: 5 times what equals 30?)



2. Suppose $\frac{1}{4}$ of the 32 members of the boys' club are going on a camping trip. How many members are going?

3. Kevin has read $\frac{1}{2}$ of his book. There are 186 pages in the book. How many more pages does he have to read before he finishes the book?

4. Bob noticed that the pattern of the tiles on his kitchen floor was like the pattern in the picture. One tile out of every four was red. There are 84 tiles on the floor. How many of the tiles are red?



Complete.

5. 1 yd. or 36 in.

$\frac{1}{4}$ yd. or ? in.

$\frac{1}{3}$ yd. or ? in.

7. 1 lb. or 16 oz.

$\frac{1}{4}$ lb. or ? oz.

$\frac{1}{2}$ lb. or ? oz.

6. 1 doz. or 12 things

$\frac{1}{2}$ doz. or ? things

$\frac{1}{3}$ doz. or ? things

8. 1 hr. or 60 min.

$\frac{1}{2}$ hr. or ? min.

9. 1 gal. or 4 qt.

$\frac{1}{4}$ gal. or ? qt.

10. 1 dollar or 100 cents

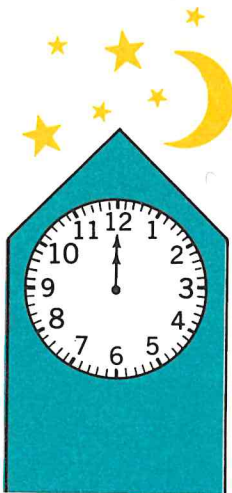
$\frac{1}{10}$ dollar or ? cents

TELLING TIME

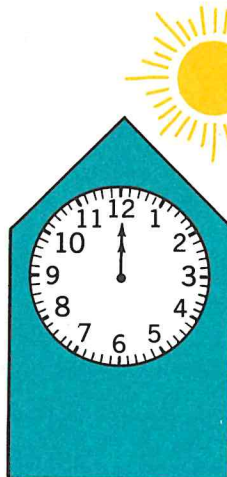
24 hours or 1 day

A.M.

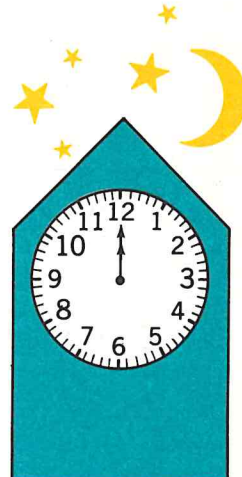
P.M.



MIDNIGHT



NOON



MIDNIGHT

A. How many times a day does the clock show 12:00?

- 12:00 during the day is 12 o'clock **noon**.
- 12:00 during the night is 12 o'clock **midnight**.

B. How many times a day does the clock show 7:23?

- 7:23 in the morning is 7:23 A.M.
- 7:23 in the evening is 7:23 P.M.

✓ What would you be doing if it were 10:30 A.M.? 10:30 P.M.?



EXERCISES

Match the activity with the time it might take place.

- | | |
|-------------------|--------------------|
| 1. Eat breakfast. | a. 7:00 A.M. |
| 2. Eat lunch. | b. 7:00 P.M. |
| 3. Sleep. | c. 12:00 noon. |
| 4. Watch T.V. | d. 12:00 midnight. |

CHECKPOINT

✓ Check your understanding of **key ideas**.

1a. $8 \div 4 = 2$, so

$$80 \div 4 = \underline{\quad ? \quad}$$

$$800 \div 4 = \underline{\quad ? \quad}$$

1b. How do you use basic facts to help you divide?

2a. $62 \div 2 = 31$

There are $\underline{\quad ? \quad}$ twos in 62.

$$2 \times 31 = \underline{\quad ? \quad}$$

2b. How do you check an answer to a division example?

3a. 15 members in the set.
 $\frac{2}{3}$ of the set has $\underline{\quad ? \quad}$ members.

3b. How do you find the number of members in part of a set when you know the number in the whole set?

✓ Check your **skills**.

1. $9 \div 3 = n$

2. $8 \div 4 = n$

3. $10 \div 5 = n$

4. $12 \div 3 = n$

5. $16 \div 4 = n$

6. $20 \div 5 = n$

7. $18 \text{ tens} \div 3 = n \text{ tens}$

8. $28 \text{ tens} \div 4 = n \text{ tens}$

9. $36 \text{ hundreds} \div 9 = n \text{ hundreds}$

10. $45 \text{ hundreds} \div 9 = n \text{ hundreds}$

11. $40 \div 2 = n$

12. $30 \div 3 = n$

13. $40 \div 5 = n$

14. $160 \div 8 = n$

15. $210 \div 7 = n$

16. $350 \div 5 = n$

17. $3 \overline{)96}$

18. $2 \overline{)46}$

19. $4 \overline{)84}$

20. $5 \overline{)55}$

21. $2 \overline{)28}$

22. $5 \overline{)255}$

23. $4 \overline{)168}$

24. $2 \overline{)106}$

25. $3 \overline{)219}$

26. $5 \overline{)405}$

27. $3 \overline{)639}$

28. $4 \overline{)844}$

29. $2 \overline{)628}$

30. $5 \overline{)555}$

31. $2 \overline{)842}$

32. $3 \overline{)\$69}$

33. $2 \overline{)\$.64}$

34. $5 \overline{)\$1.55}$

35. $4 \overline{)\$2.48}$

36. $3 \overline{)\$2.79}$

UNIT TEST

Complete each sentence.

1. $247 \times 3 = 741$, so $741 \div 3 = \underline{\quad}$

2. $63 \div 3 = (\underline{\quad} \div 3) + (3 \div 3)$

Find the answers.

3. Jane bought 3 pairs of socks for \$1.26.

How much did she pay for each pair?

4. A pen costs \$.49. About how much would 4 pens cost?

a. \$1.50 b. \$2.00 c. \$2.50 d. \$3.00

5. There are 12 crayons in the box.

How many crayons are in $\frac{2}{3}$ of the box?

6. There are 12 inches in a foot.

How many inches are there in $\frac{1}{4}$ foot?



Find the quotients.

7. $84 \div 4 = \underline{\quad}$

8. $3 \overline{)969}$

9. $5 \overline{)150}$

10. $8 \overline{)\$32.00}$

If you have time, try these.

Name three numbers that make each sentence true.

11. $n \times 6 < 30$

12. $10 < n \times 3$

MATHAMUSEMENTS

How far can you double? Can you complete the set?

{2, 4, 8, 16, ?, ?, ?, ?}

{3, 6, 12, 24, ?, ?, ?, ?}

{5, 10, 20, 40, ?, ?, ?, ?}

{25, 50, 100, 200, ?, ?, ?, ?}

INQUIRY INTO NUMBER

Primes and Composites

With a number of blocks shaped like squares, you can make a number of figures shaped like rectangles.

- With 2 squares, you can make only one rectangle.



- With 4 squares, you can make two different rectangles.



or



Cut 20 square-shaped pieces from construction paper. Make sure all the squares are the same size. Use these squares to help you copy and complete these charts.

Copy and complete the charts.

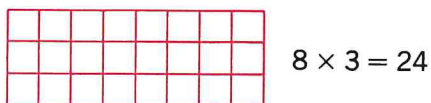
NUMBER OF SQUARES	NUMBER OF RECTANGLES	NUMBER OF SQUARES	NUMBER OF RECTANGLES
2	1	11	<u>?</u>
3	1	12	<u>?</u>
4	2	13	<u>?</u>
5	1	14	<u>?</u>
6	2	15	<u>?</u>
7	<u>?</u>	16	<u>?</u>
8	<u>?</u>	17	<u>?</u>
9	<u>?</u>	18	<u>?</u>
10	<u>?</u>	19	<u>?</u>

- Using 2 squares you can make only 1 rectangle. For which other numbers of squares can you make only 1 rectangle? These numbers are called **prime numbers**.
- You can make more than 1 rectangle with 4 squares. For which other numbers can you make more than 1 rectangle? These numbers are called **composite numbers**.

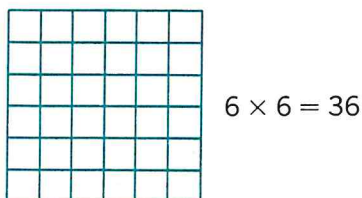
Can you make more than 1 rectangle with 24 squares?
Is 24 a prime number or is it a composite number?

■ Shown below are 3 rectangles made with 24 squares.

Make another rectangle with 24 squares.



The rectangles below were made with 36 squares.
There are 3 other rectangles you can make with 36 squares.
See if you can make them.



The sentences above show 3 ways you can write 36 as the product of two whole numbers. Write sentences like these for the rectangles you made.

■ Is 36 a prime number or is it a composite number?

For Further Inquiry

Tell whether each of the numbers from 21 through 50 is a prime number or a composite number.

EXPLORING WITH 6 AS A FACTOR

A. You know most multiplication facts with 6 as a factor.

■ Give each product.

$$\begin{array}{l} 0 \times 6 = \underline{\quad} \\ 6 \times 0 = \underline{\quad} \end{array}$$

$$\begin{array}{l} 1 \times 6 = \underline{\quad} \\ 6 \times 1 = \underline{\quad} \end{array}$$

$$\begin{array}{l} 2 \times 6 = \underline{\quad} \\ 6 \times 2 = \underline{\quad} \end{array}$$

$$\begin{array}{l} 3 \times 6 = \underline{\quad} \\ 6 \times 3 = \underline{\quad} \end{array}$$

$$\begin{array}{l} 4 \times 6 = \underline{\quad} \\ 6 \times 4 = \underline{\quad} \end{array}$$

$$\begin{array}{l} 5 \times 6 = \underline{\quad} \\ 6 \times 5 = \underline{\quad} \end{array}$$

B. Count by 6's to 60. Begin this way: "One six is six. Two sixes is twelve. Three sixes is eighteen."

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
6	12	18	24	30	36	42	48	54	60

- When you count by 6's, which answers are multiples of 10?
- Which answers are less than 30? in the 30's?
in the 40's? in the 50's? in the 60's?

C. Suppose you want a fact you do not know.

■ Start with a fact you do know.

Since $5 \times 6 = 30$, then $6 \times 6 = 30 + 6$, or $\underline{\quad}$.

Since $10 \times 6 = 60$, then $9 \times 6 = 60 - 6$, or $\underline{\quad}$.

Since $6 \times 6 = 36$, then $7 \times 6 = 36 + 6$, or $\underline{\quad}$.

■ Use the associative property.

$$\begin{aligned} 6 \times 6 &= (2 \times 3) \times 6 \\ &= 2 \times (3 \times 6) \\ &= 2 \times 18 \\ &= 36 \end{aligned}$$

$$\text{So, } 6 \times 6 = \underline{\quad}$$

$$\begin{aligned} 8 \times 6 &= (2 \times 4) \times 6 \\ &= 2 \times (4 \times 6) \\ &= 2 \times 24 \\ &= 48 \end{aligned}$$

$$\text{So, } 8 \times 6 = \underline{\quad}$$

EXERCISES

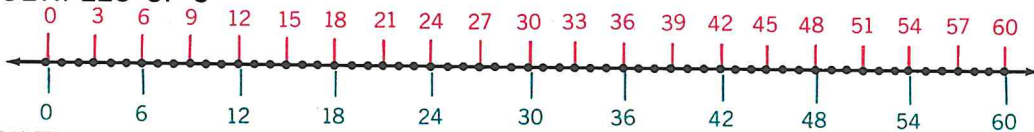
Solve. Use the diagram in **B** if you need help.

- | | | |
|---------------------------------------|--|---------------------------------------|
| *1. 2 sixes = n
$2 \times 6 = n$ | 2. 4 sixes = a
$4 \times 6 = a$ | 3. 6 sixes = y
$6 \times 6 = y$ |
| 4. 8 sixes = b
$8 \times 6 = b$ | 5. 10 sixes = c
$10 \times 6 = c$ | 6. 0 sixes = x
$0 \times 6 = x$ |
| 7. 1 six = e
$1 \times 6 = e$ | 8. 3 sixes = d
$3 \times 6 = d$ | 9. 5 sixes = f
$5 \times 6 = f$ |
| 10. 7 sixes = g
$7 \times 6 = g$ | 11. 9 sixes = h
$9 \times 6 = h$ | 12. 6 zeros = q
$6 \times 0 = q$ |

Solve. Use the given fact if you need help.

- *13. Since $6 \times 6 = 36$, then $7 \times 6 = a$.
 14. Since $5 \times 6 = 30$, then $4 \times 6 = b$.
 15. Since $10 \times 6 = 60$, then $9 \times 6 = c$.
 16. Since $2 \times 6 = 12$, then $4 \times 6 = d$.
 17. Since $4 \times 6 = 24$, then $8 \times 6 = e$.

MULTIPLES OF 3



MULTIPLES OF 6

Solve. Use the diagram above if you need help.

18. Which multiples of 3 are also multiples of 6?

- | | | |
|---|---|---|
| *19. $\underline{\quad}$ six = 6
$\underline{\quad}$ threes = 6 | 20. $\underline{\quad}$ sixes = 12
$\underline{\quad}$ threes = 12 | 21. $\underline{\quad}$ sixes = 18
$\underline{\quad}$ threes = 18 |
| 22. $\underline{\quad}$ sixes = 24
$\underline{\quad}$ threes = 24 | 23. $\underline{\quad}$ sixes = 30
$\underline{\quad}$ threes = 30 | 24. $\underline{\quad}$ sixes = 60
$\underline{\quad}$ threes = 60 |

* 1. 12; 12 13. 42 19. 1; 2

MULTIPLICATION WITH 6 AS A FACTOR

A. Read the table below. Begin by saying: "Zero times six is zero. One times six is six."

Multiplication facts with 6 as a factor									
6	6	6	6	6	6	6	6	6	6
$\times 0$	$\times 1$	$\times 2$	$\times 3$	$\times 4$	$\times 5$	$\times 6$	$\times 7$	$\times 8$	$\times 9$
0	6	12	18	24	30	36	42	48	54
0	1	2	3	4	5	6	7	8	9
$\times 6$	$\times 6$	$\times 6$	$\times 6$	$\times 6$	$\times 6$	$\times 6$	$\times 6$	$\times 6$	$\times 6$
0	6	12	18	24	30	36	42	48	54

EXERCISES

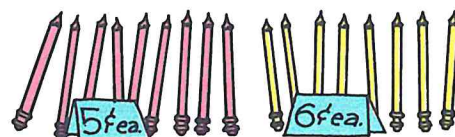
Practice until you can write every answer correctly.

1. $\begin{array}{r} 6 \\ \times 1 \\ \hline \end{array}$
2. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$
3. $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$
4. $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$
5. $\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$
6. $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$
7. $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$
8. $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$
9. $\begin{array}{r} 1 \\ \times 6 \\ \hline \end{array}$
10. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$
11. $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$
12. $\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$
13. $\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$
14. $\begin{array}{r} 0 \\ \times 6 \\ \hline \end{array}$
15. $\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$
16. $\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$
17. $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$
18. $\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$

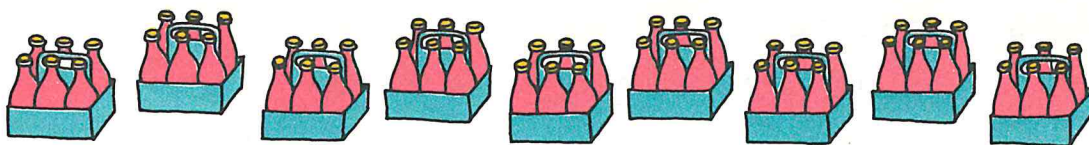
19. Think of each answer to Ex. 1–18 and to it add 4; add 3; add 5.

Find the answer.

20. Which would cost more,
9 five-cent pencils
or 8 six-cent pencils?
How much more?



USING 6 IN MULTIPLICATION



A. A pack of soda has 6 bottles. How many bottles are there in 4 packs of soda?

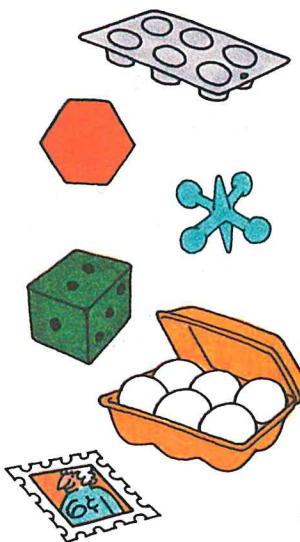
■ $4 \times 6 = \underline{\quad ? \quad}$

✓ How many bottles are there in 5 packs? in 2 packs?
in 9 packs? 3 packs? 0 packs? 1 pack?

EXERCISES

Find the answer.

- *1. There are 6 muffins in 1 tin.
How many muffins in 7 tins?
2. There are 6 sides to a hexagon.
How many sides to 8 hexagons?
3. There are 6 ends on a jack.
How many ends on 3 jacks?
4. There are six sides on a die.
How many sides on a pair of dice?
5. There are 6 eggs in a half-dozen.
How many eggs in a dozen?
6. Stamps cost 6¢ each.
How much would 5 stamps cost?



MULTIPLYING TENS AND HUNDREDS BY 6

A. Count by 6's to 60.

{6, 12, 18, , , , , , , 60}

B. Use $6 \times 7 = 42$ to help you solve each sentence.

- 6×7 tens = 42 tens, or ??0.
- 6×7 hundreds = 42 hundreds, or ??00.

C. Use $6 \times 8 = 48$ to help find these products.

- $6 \times 80 = 6 \times 8$ tens = 48 tens, or ??0.
- $6 \times 800 = 6 \times 8$ hundreds = 48 hundreds, or ??00.

EXERCISES

Find each answer.

*1. $6 \times 3 = a$

6×3 tens = a tens

$6 \times 30 = ??0$

2. $3 \times 6 = b$

3×6 tens = b tens

$3 \times 60 = ??0$

3. $6 \times 5 = n$

6×5 hundreds = n hundreds

$6 \times 500 = ??00$

4. $8 \times 6 = y$

8×6 hundreds = y hundreds

$8 \times 600 = ??00$

*5. $6 \times 1 = m$

$6 \times 10 = ?0$

6. $6 \times 6 = a$

$6 \times 60 = ??0$

7. $6 \times 9 = c$

$6 \times 90 = ??0$

8. $2 \times 6 = a$

$2 \times 600 = ??00$

9. $4 \times 6 = b$

$4 \times 600 = ??00$

10. $10 \times 6 = n$

$10 \times 60 = ??0$

*11.
$$\begin{array}{r} 60 \\ \times 2 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 10 \\ \times 6 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 60 \\ \times 4 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 60 \\ \times 6 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 60 \\ \times 5 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 800 \\ \times 6 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 600 \\ \times 3 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 900 \\ \times 6 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 600 \\ \times 0 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 700 \\ \times 6 \\ \hline \end{array}$$

* 1. 18; 18; 180 5. 6; 60 11. 120

MULTIPLYING ONES, TENS, AND HUNDREDS

A. Find the products.

■ $6 \times 3 = \underline{\quad}$ $6 \times 20 = \underline{\quad}$ $6 \times 500 = \underline{\quad}$

■ Use your answers above to find the product of 6 and 523.

$18 + 120 + 3000 = \underline{\quad}$

B. Copy and complete each example.

■ $6 \times 523 = 6 \times (500 + 20 + 3)$
 $= (6 \times 500) + (6 \times 20) + (6 \times 3)$
 $= \underline{\quad} + \underline{\quad} + \underline{\quad}$
 $= \underline{\quad}$

■

	523
	<u>× 6</u>
$6 \times 3 \longrightarrow$??
$6 \times 20 \longrightarrow$???
$6 \times 500 \longrightarrow$????
$6 \times 523 \longrightarrow$????

■

	523
	<u>× 6</u>
	????

EXERCISES

Find the products.

1. $6 \times 9 = \underline{\quad}$

$6 \times 30 = \underline{\quad}$

$6 \times 200 = \underline{\quad}$

$6 \times 239 = \underline{\quad}$

2. $6 \times 6 = \underline{\quad}$

$6 \times 70 = \underline{\quad}$

$6 \times 800 = \underline{\quad}$

$6 \times 876 = \underline{\quad}$

3. $6 \times 1 = \underline{\quad}$

$6 \times 40 = \underline{\quad}$

$6 \times 600 = \underline{\quad}$

$6 \times 641 = \underline{\quad}$

*4. $\begin{array}{r} 234 \\ \times 6 \\ \hline \end{array}$

5. $\begin{array}{r} 810 \\ \times 6 \\ \hline \end{array}$

6. $\begin{array}{r} 627 \\ \times 6 \\ \hline \end{array}$

7. $\begin{array}{r} 859 \\ \times 6 \\ \hline \end{array}$

8. $\begin{array}{r} 228 \\ \times 6 \\ \hline \end{array}$

*9. $\begin{array}{r} \$1.38 \\ \times 6 \\ \hline \end{array}$

10. $\begin{array}{r} \$3.94 \\ \times 6 \\ \hline \end{array}$

11. $\begin{array}{r} \$6.42 \\ \times 6 \\ \hline \end{array}$

12. $\begin{array}{r} \$5.00 \\ \times 6 \\ \hline \end{array}$

13. $\begin{array}{r} \$7.03 \\ \times 6 \\ \hline \end{array}$

* 4. 1404 9. \$8.28

MORE WAYS THAN ONE

Often there is more than one way to think about a problem. Decide which two sentences could be used to solve the problem. Then find the number that makes both sentences true.

- A.** A Ferris wheel can hold 48 people. There are 2 people in each seat. How many seats does the Ferris wheel have?

$$2 \times 48 = \triangle$$

$$\triangle \times 2 = 48$$

$$48 \div 2 = \triangle$$

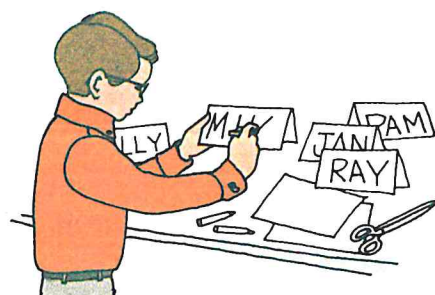


- B.** The name cards for a class party were made by 4 children. Each child made 8 cards. How many cards did they make in all?

$$4 \times n = 8$$

$$4 \times 8 = n$$

$$8 + 8 + 8 + 8 = n$$

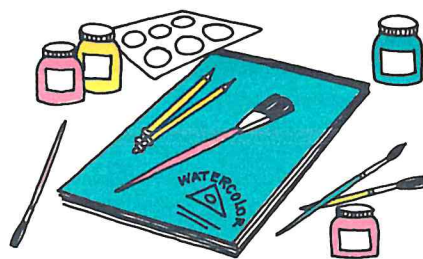


- C.** Stan has \$3.19. He wants to buy paint supplies for \$5.00. How much more money does he need?

$$\$3.19 + \square = \$5.00$$

$$\$5.00 - \$3.19 = \square$$

$$\$3.19 + \$5.00 = \square$$



EXERCISES

Decide which two sentences could be used to solve the problem.
Copy the two number sentences. Then solve the problem.

1. Rhoda has 150 pictures to paste in her photograph album.
She wants to put 5 pictures on each page. How many pages
will she need?

$$5 \times 150 = n$$

$$n \times 5 = 150$$

$$150 \div 5 = n$$

2. There are 24 hours in one day.
How many hours are there in one week?

$$24 \div 7 = n$$

$$7 \times 24 = n$$

$$24 + (6 \times 24) = n$$

3. Kathy saw 5 boxes of candles in a store window. There were
12 candles in each box. How many candles did she see in all?

$$5 \times 12 = n$$

$$(3 \times 12) + (2 \times 12) = n$$

$$n \times 5 = 12$$

4. The thermometer has gone from 48 degrees to 64 degrees.
How many degrees has the temperature risen?

$$64 - 48 = n$$

$$48 + n = 64$$

$$48 + 64 = n$$

5. One melon serves 2 persons.
How many melons are needed to serve 10 persons?

$$2 \times 10 = n$$

$$10 \div 2 = n$$

$$2 \times n = 10$$

6. Two boys gathered 18 pine cones. If they share them equally,
how many cones will each boy get?

$$18 - 2 = n$$

$$18 \div 2 = n$$

$$2 \times n = 18$$

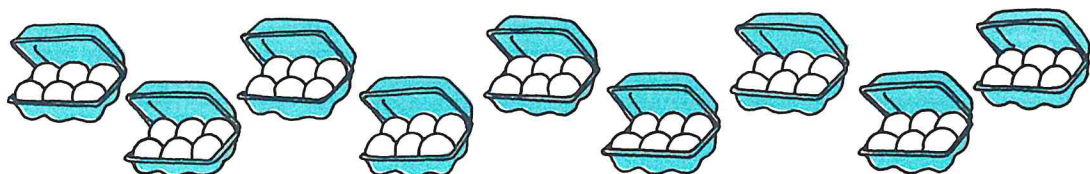
7. There are 24 bottles in a case of soda. If 15 bottles have
been used, how many bottles are left?

$$n + 15 = 24$$

$$24 + 15 = n$$

$$24 - 15 = n$$

DIVIDING BY 6



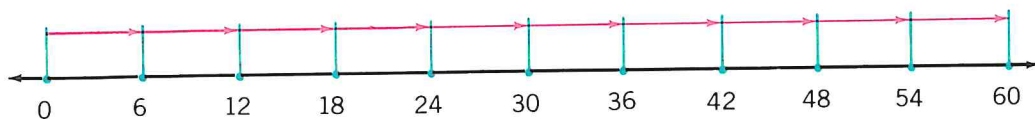
A. Each carton holds 6 eggs. There are 48 eggs to pack.
How many cartons are needed?

- You can think:
6 eggs fill a carton.
How many 6's make 48?
- Count by 6's to find out.
 $\underline{\quad} \text{ sixes} = 48$
 $\underline{\quad} \times 6 = 48$

B. You can write $48 \div 6 = n$ to find how many 6's make 48.

- Since $8 \times 6 = 48$, then $48 \div 6 = \underline{\quad}$.
- 48 eggs fill $\underline{\quad}$ cartons with 6 eggs in each.

C. You can use a number line to help you divide.



- Count the arrows.

$$\begin{array}{|l} \underline{\quad} \times 6 = 30 \\ 30 \div 6 = \underline{\quad} \end{array}$$

$$\begin{array}{|l} \underline{\quad} \times 6 = 24 \\ 24 \div 6 = \underline{\quad} \end{array}$$

$$\begin{array}{|l} \underline{\quad} \times 6 = 18 \\ 18 \div 6 = \underline{\quad} \end{array}$$

✓ Find n .

$$\begin{array}{|l} n \times 6 = 12 \\ 12 \div 6 = n \end{array}$$

$$\begin{array}{|l} n \times 6 = 24 \\ 24 \div 6 = n \end{array}$$

$$\begin{array}{|l} n \times 6 = 42 \\ 42 \div 6 = n \end{array}$$

$$\begin{array}{|l} n \times 6 = 54 \\ 54 \div 6 = n \end{array}$$

EXERCISES

Find n . Use the given fact to help you.

- *1. $3 \times 6 = 18$
 $18 \div 6 = n$

4. $1 \times 6 = 6$
 $6 \div 6 = n$

7. $6 \times 7 = 42$
 $42 \div 6 = n$

10. $30 \div 6 = 5$
 $36 \div 6 = n$

2. $6 \times 6 = 36$
 $36 \div 6 = n$

5. $4 \times 6 = 24$
 $24 \div 6 = n$

8. $5 \times 6 = 30$
 $30 \div 6 = n$

11. $60 \div 6 = 10$
 $54 \div 6 = n$

3. $10 \times 6 = 60$
 $60 \div 6 = n$

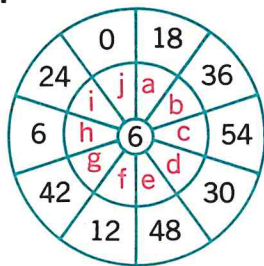
6. $2 \times 6 = 12$
 $12 \div 6 = n$

9. $6 \times 8 = 48$
 $48 \div 6 = n$

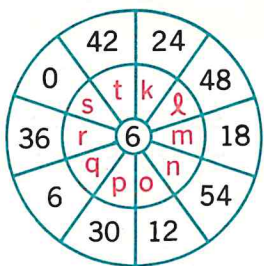
12. $24 \div 6 = 4$
 $24 \div 4 = n$

Name the missing factors.

13.

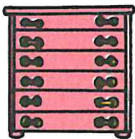


14.

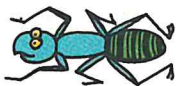


Find each answer.

15. 12 brass handles. 2 on each drawer.
 ? drawers.



16. 6 legs on an ant. 42 legs in all.
 ? ants.



17. 60 strings. 10 guitars.
 ? strings on each guitar.



Think Twice

18. A submarine can go as deep as 6000 feet, or 1000 fathoms.
 How many feet make one fathom?

* 1. 3

DIVISION FACTS WITH 6 AS A FACTOR

A. Read the division facts in this table.

Begin by saying, "Zero equals how many sixes? Zero.
Six equals how many sixes? One".

Division facts with 6 as a factor									
0	1	2	3	4	5	6	7	8	9
$6 \overline{)0}$	$6 \overline{)6}$	$6 \overline{)12}$	$6 \overline{)18}$	$6 \overline{)24}$	$6 \overline{)30}$	$6 \overline{)36}$	$6 \overline{)42}$	$6 \overline{)48}$	$6 \overline{)54}$
	6	6	6	6	6	6	6	6	6
	$1 \overline{)6}$	$2 \overline{)12}$	$3 \overline{)18}$	$4 \overline{)24}$	$5 \overline{)30}$	$6 \overline{)36}$	$7 \overline{)42}$	$8 \overline{)48}$	$9 \overline{)54}$

B. Now read the facts another way. Begin, "Zero divided by six equals zero. Six divided by six equals one."

EXERCISES

Practice until you can write every answer correctly.

1. $6 \overline{)24}$

2. $7 \overline{)42}$

3. $6 \overline{)18}$

4. $8 \overline{)48}$

5. $6 \overline{)36}$

6. $3 \overline{)18}$

7. $6 \overline{)12}$

8. $4 \overline{)24}$

9. $6 \overline{)30}$

10. $9 \overline{)54}$

11. $6 \overline{)0}$

12. $6 \overline{)6}$

13. $6 \overline{)42}$

14. $6 \overline{)54}$

15. $6 \overline{)48}$

Is the number a multiple of 6? Write Yes or No.

16. 26

17. 24

18. 16

19. 44

20. 54

21. 18

Solve. Replace ● with <, =, or >.

22. $5 \times 6 \text{ } \bullet \text{ } 29$

23. $6 \times 9 \text{ } \bullet \text{ } 50$

24. $7 \times 9 \text{ } \bullet \text{ } 70$

25. $48 \div 6 \text{ } \bullet \text{ } 8$

26. $40 \div 6 \text{ } \bullet \text{ } 6$

27. $50 \div 6 \text{ } \bullet \text{ } 8$

28. $16 \div 6 \text{ } \bullet \text{ } 3$

29. $58 \div 6 \text{ } \bullet \text{ } 7$

30. $39 \div 6 \text{ } \bullet \text{ } 7$

KEEPING UP IN MATHEMATICS

Which is greater? [166-67]

1. $\frac{1}{2}$ or $\frac{1}{3}$
2. $\frac{1}{5}$ or $\frac{1}{4}$
3. $\frac{2}{3}$ or 1
4. $\frac{3}{2}$ or 1

Arrange in order from least to greatest. [92-93, 166-67]

5. $\{\frac{1}{7}, \frac{1}{8}, \frac{1}{9}\}$
6. $\{\frac{1}{5}, \frac{0}{5}, \frac{5}{5}\}$
7. $\{\frac{6}{4}, \frac{4}{4}, \frac{8}{4}\}$
8. $\{\frac{4}{4}, \frac{1}{2}, \frac{3}{4}\}$

Name the number from the set below that matches each point. [166-67]



$\{\frac{2}{10}, \frac{3}{10}, \frac{9}{10}, \frac{6}{10}, \frac{10}{10}, \frac{5}{10}\}$

9. A
10. B
11. C
12. D
13. E
14. F

Complete each sentence. [326]

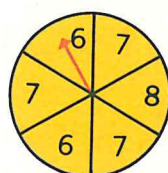
15. $\frac{1}{4}$ lb. makes ? oz.
16. $\frac{1}{2}$ gal. makes ? qt.
17. $\frac{1}{6}$ doz. makes ? things

On each spinner, which number are you most likely to get? Which number are you least likely to get? [298-301]

18.



19.



Which of these figures are closed surfaces? Which are closed paths? [80-83]

20.



21.



22.

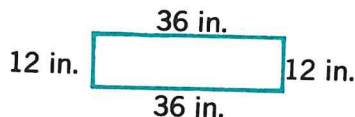


23.



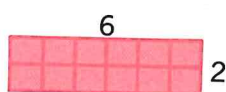
What is the total length of the sides of this figure? [88-89]

24.



How many square units cover this figure? [90-91]

25.



THE GREATEST NUMBER OF SIXES

A. Name the multiples of 6 from 0 through 60.

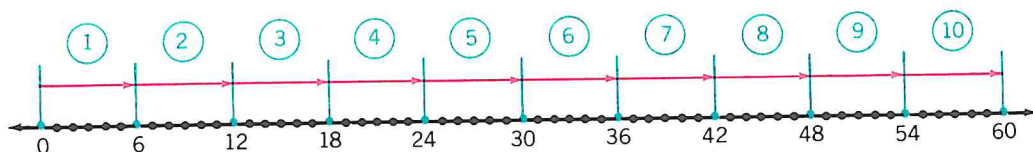
- When multiples of 6 are divided by 6 they all have the same remainder. What is it?



B. Find 38 on the chart.
There are 6 rows of 6 circles above 38.
So the greatest number of 6's in 38 is ?.
The remainder is ?.

✓ Find the greatest whole number that makes each sentence true.

$$\triangle \times 6 < 41 \quad \triangle \times 6 < 20 \quad \triangle \times 6 < 55 \quad \triangle \times 6 < 9$$



C. What do the black numerals show? the blue numerals?

- Use the number line to divide 25 by 6.
Find the mark for 25.
What is the greatest number of sixes in 25?
4 sixes = 24 So, 25 = 4 sixes and ? left over.

- You can show that 25 = 4 sixes and 1 left over in two ways.

$$25 = (4 \times 6) + 1$$

$$\begin{array}{r} 4 \text{ r}1 \\ 6 \overline{)25} \\ \underline{24} \\ 1 \end{array}$$

EXERCISES

Find the greatest whole number that makes the sentence true.

- | | | |
|-------------------------------|-------------------------------|-------------------------------|
| *1. $\triangle \times 6 < 22$ | 2. $\triangle \times 6 < 4$ | 3. $\triangle \times 6 < 35$ |
| 4. $\triangle \times 6 < 53$ | 5. $\triangle \times 6 < 59$ | 6. $\triangle \times 6 < 16$ |
| 7. $\triangle \times 6 < 3$ | 8. $\triangle \times 6 < 47$ | 9. $\triangle \times 6 < 25$ |
| 10. $\triangle \times 6 < 44$ | 11. $\triangle \times 6 < 11$ | 12. $\triangle \times 6 < 39$ |
| 13. $\triangle \times 6 < 13$ | 14. $\triangle \times 6 < 7$ | 15. $\triangle \times 6 < 32$ |
| 16. $\triangle \times 6 < 17$ | 17. $\triangle \times 6 < 21$ | 18. $\triangle \times 6 < 34$ |
| 19. $\triangle \times 6 < 49$ | 20. $\triangle \times 6 < 56$ | 21. $\triangle \times 6 < 15$ |
| 22. $\triangle \times 6 < 37$ | 23. $\triangle \times 6 < 28$ | 24. $\triangle \times 6 < 40$ |
| 25. $\triangle \times 6 < 57$ | 26. $\triangle \times 6 < 45$ | 27. $\triangle \times 6 < 8$ |
| 28. $\triangle \times 6 < 52$ | 29. $\triangle \times 6 < 31$ | 30. $\triangle \times 6 < 19$ |
| 31. $\triangle \times 6 < 23$ | 32. $\triangle \times 6 < 10$ | 33. $\triangle \times 6 < 26$ |
| 34. $\triangle \times 6 < 9$ | 35. $\triangle \times 6 < 29$ | 36. $\triangle \times 6 < 2$ |

Find q .

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 37. $28 = (q \times 6) + 4$ | 38. $43 = (q \times 6) + 1$ | 39. $17 = (q \times 6) + 5$ |
| 40. $57 = (q \times 6) + 3$ | 41. $60 = (q \times 6) + 0$ | 42. $33 = (q \times 6) + 3$ |

Find r .

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 43. $29 = (4 \times 6) + r$ | 44. $44 = (7 \times 6) + r$ | 45. $18 = (3 \times 6) + r$ |
| 46. $27 = (4 \times 6) + r$ | 47. $42 = (7 \times 6) + r$ | 48. $16 = (2 \times 6) + r$ |

Find the greatest whole number for q and then find r .

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 49. $54 = (q \times 6) + r$ | 50. $50 = (q \times 6) + r$ | 51. $58 = (q \times 6) + r$ |
| 52. $43 = (q \times 6) + r$ | 53. $46 = (q \times 6) + r$ | 54. $51 = (q \times 6) + r$ |
| 55. $27 = (q \times 6) + r$ | 56. $14 = (q \times 6) + r$ | 57. $39 = (q \times 6) + r$ |

Find the quotient and remainder.

- | | | | | |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| 58. $6 \overline{)10}$ | 59. $6 \overline{)41}$ | 60. $6 \overline{)52}$ | 61. $6 \overline{)20}$ | 62. $6 \overline{)49}$ |
| 63. $6 \overline{)31}$ | 64. $6 \overline{)19}$ | 65. $6 \overline{)38}$ | 66. $6 \overline{)21}$ | 67. $6 \overline{)11}$ |

* 1. 3 37. 4 43. 5 49. 9; 0 58. 1 r4

USING DIVISION

A. Find the product.

■ $1 \times 6 = \underline{\quad}$

■ $10 \times 6 = \underline{\quad}$

■ $100 \times 6 = \underline{\quad}$

B. Name the examples below that have an answer greater than 100.
an answer less than 100? How can you tell?

■ $6 \overline{)66}$

■ $6 \overline{)666}$

■ $6 \overline{)306}$

■ $6 \overline{)5466}$

C. Name the example below that has an answer of about 10;
about 30; about 50; about 100.

■ $6 \overline{)315}$

■ $6 \overline{)189}$

■ $6 \overline{)623}$

■ $6 \overline{)67}$

EXERCISES

Find each quotient.

*1. $6 \overline{)6}$

2. $6 \overline{)12}$

3. $6 \overline{)42}$

4. $6 \overline{)18}$

$6 \overline{)60}$

$6 \overline{)120}$

$6 \overline{)420}$

$6 \overline{)180}$

$6 \overline{)600}$

$6 \overline{)1200}$

$6 \overline{)4200}$

$6 \overline{)1800}$

$6 \overline{)6000}$

$6 \overline{)12,000}$

$6 \overline{)42,000}$

$6 \overline{)18,000}$

Choose the best answer from those given.

*5. $6 \overline{)546}$ {9, 91, 910}

6. $6 \overline{)426}$ {701, 71, 710}

7. $5 \overline{)300}$ {600, 60, 6}

8. $9 \overline{)549}$ {61, 91, 69}

9. $6 \overline{)120}$ {2, 20, 26}

10. $6 \overline{)4800}$ {80, 800, 8000}

Find each quotient.

*11. $6 \overline{)66}$

12. $6 \overline{)540}$

13. $6 \overline{)480}$

14. $6 \overline{)246}$

15. $6 \overline{)306}$

* 1. 1; 10; 100; 1000

5. 91

11. 11

MULTIPLICATION AND DIVISION PRACTICE

Find each answer.

1. $6 \times 1 = \underline{\quad ? \quad}$

$6 \times 10 = \underline{\quad ? \quad}$

$6 \times 100 = \underline{\quad ? \quad}$

4. $6 \div 6 = \underline{\quad ? \quad}$

$60 \div 6 = \underline{\quad ? \quad}$

$600 \div 6 = \underline{\quad ? \quad}$

2. $4 \times 100 = \underline{\quad ? \quad}$

$4 \times 10 = \underline{\quad ? \quad}$

$4 \times 1 = \underline{\quad ? \quad}$

5. $400 \div 4 = \underline{\quad ? \quad}$

$40 \div 4 = \underline{\quad ? \quad}$

$4 \div 4 = \underline{\quad ? \quad}$

3. $3 \times 1 = \underline{\quad ? \quad}$

$3 \times 10 = \underline{\quad ? \quad}$

$3 \times 100 = \underline{\quad ? \quad}$

6. $3 \div 3 = \underline{\quad ? \quad}$

$30 \div 3 = \underline{\quad ? \quad}$

$300 \div 3 = \underline{\quad ? \quad}$

Find n .

7. $30 = n \times 6$

8. $6 \times 8 = n$

9. $6 = n \times 6$

10. $9 \times 6 = n$

11. $48 = n \times 6$

12. $3 \times 6 = n$

13. $12 = n \times 6$

14. $6 \times 6 = n$

15. $42 = n \times 6$

16. $10 \times 6 = n$

17. $0 \times 6 = n$

18. $5 \times 6 = n$

Replace \bullet with $<$, $=$, or $>$ to make each sentence true.

19. $6 \times 3 \bullet 5 \times 4$

20. $6 \times 8 \bullet 8 \times 6$

21. $6 \times 4 \bullet 2 \times 9$

22. $36 \div 6 \bullet 24 \div 4$

23. $45 \div 5 \bullet 60 \div 6$

24. $21 \div 3 \bullet 12 \div 2$

25. $4 \times 8 \bullet 54 \div 9$

26. $16 \div 2 \bullet 3 \times 3$

27. $48 \div 8 \bullet 2 \times 3$

Find each product.

28. $\begin{array}{r} 27 \\ \times 6 \\ \hline \end{array}$

29. $\begin{array}{r} 46 \\ \times 6 \\ \hline \end{array}$

30. $\begin{array}{r} 18 \\ \times 6 \\ \hline \end{array}$

31. $\begin{array}{r} 25 \\ \times 6 \\ \hline \end{array}$

32. $\begin{array}{r} 39 \\ \times 6 \\ \hline \end{array}$

33. $\begin{array}{r} 513 \\ \times 6 \\ \hline \end{array}$

34. $\begin{array}{r} 421 \\ \times 6 \\ \hline \end{array}$

35. $\begin{array}{r} 367 \\ \times 6 \\ \hline \end{array}$

36. $\begin{array}{r} 485 \\ \times 6 \\ \hline \end{array}$

37. $\begin{array}{r} 109 \\ \times 6 \\ \hline \end{array}$

Find each quotient and remainder.

38. $6 \overline{)25}$

39. $6 \overline{)16}$

40. $6 \overline{)32}$

41. $6 \overline{)45}$

42. $6 \overline{)38}$

43. $6 \overline{)600}$

44. $6 \overline{)126}$

45. $6 \overline{)306}$

46. $6 \overline{)612}$

47. $6 \overline{)246}$

CHECKPOINT

✓ Check your understanding of **key ideas**.

1a. $5 \times 6 = 30$, so $4 \times 6 = \underline{\quad}$
 $10 \times 6 = 60$, so $9 \times 6 = \underline{\quad}$

1b. How can you use a fact you know to find a fact you do not know?

2a. $6 \times 9 = 54$
 6×9 tens = $\underline{\quad}$ tens
 6×9 hundreds = $\underline{\quad}$ hundreds

2b. How is multiplying tens and hundreds like multiplying ones?

3a. $18 \div 6 = \underline{\quad}$
 $36 \div 6 = \underline{\quad}$
 $42 \div 6 = \underline{\quad}$

3b. Any multiple of 6 when divided by 6 has a remainder of $\underline{\quad}$.

4a. $\begin{array}{r} 3 \text{ r?} \\ 6 \overline{)19} \end{array}$ $\begin{array}{r} 9 \text{ r?} \\ 6 \overline{)57} \end{array}$ $\begin{array}{r} 4 \text{ r?} \\ 6 \overline{)29} \end{array}$

4b. When you divide a number by 6 the greatest remainder possible is $\underline{\quad}$.

✓ Check your **skills**.

Find the answer.

1. $\begin{array}{r} 20 \\ \times 6 \\ \hline \end{array}$

2. $\begin{array}{r} 0 \\ \times 6 \\ \hline \end{array}$

3. $\begin{array}{r} 60 \\ \times 8 \\ \hline \end{array}$

4. $\begin{array}{r} 40 \\ \times 6 \\ \hline \end{array}$

5. $\begin{array}{r} 90 \\ \times 6 \\ \hline \end{array}$

6. $\begin{array}{r} 300 \\ \times 6 \\ \hline \end{array}$

7. $\begin{array}{r} 500 \\ \times 6 \\ \hline \end{array}$

8. $\begin{array}{r} 700 \\ \times 6 \\ \hline \end{array}$

9. $\begin{array}{r} 100 \\ \times 6 \\ \hline \end{array}$

10. $\begin{array}{r} 600 \\ \times 6 \\ \hline \end{array}$

11. $\begin{array}{r} 924 \\ \times 6 \\ \hline \end{array}$

12. $\begin{array}{r} 412 \\ \times 6 \\ \hline \end{array}$

13. $\begin{array}{r} 675 \\ \times 6 \\ \hline \end{array}$

14. $\begin{array}{r} 396 \\ \times 6 \\ \hline \end{array}$

15. $\begin{array}{r} 800 \\ \times 6 \\ \hline \end{array}$

16. $6 \overline{)12}$

17. $6 \overline{)33}$

18. $6 \overline{)38}$

19. $6 \overline{)54}$

20. $6 \overline{)4}$

21. $6 \overline{)9}$

22. $6 \overline{)23}$

23. $6 \overline{)21}$

24. $6 \overline{)47}$

25. $6 \overline{)5}$

UNIT TEST

Find the answers.

1. Dan wanted to mail 20 letters. Stamps cost 6¢ each.
How much money must Dan spend on stamps?
2. John puts 6 cans in each box. He has 60 cans.
How many boxes does he need?
3. What number makes this sentence true? $45 = (6 \times 7) + \square$
4. What remainders are possible when you divide by 6?

Find the products.

$$\begin{array}{r} 5. \ 43 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \ 879 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \ \$2.50 \\ \times 6 \\ \hline \end{array}$$

Find the quotients and remainders.

$$8. \ 6 \overline{)27}$$

$$9. \ 300 \div 6 = \underline{\quad}?$$

$$10. \ 0 \div 6 = \underline{\quad}?$$

If you have time, try these.

$$11. \ 8 \times 8 = (\underline{\quad} \times 8) + (4 \times 8) = \underline{\quad} + \underline{\quad}, \text{ or } \underline{\quad}$$

$$12. \ 9 \times 9 = (\underline{\quad} \times 9) + (4 \times 9) = \underline{\quad} + \underline{\quad}, \text{ or } \underline{\quad}$$

MATHAMUSEMENTS

Copy the puzzle. First solve each sentence under *Across*.
Then check your answers by solving the sentences under *Down*.
Write only one digit in each box.

ACROSS

$$a. \ 30 \div 6 = \underline{\quad}?$$

$$b. \ 13 - 8 = \underline{\quad}?$$

$$c. \ 682 \times 6 = \underline{\quad}?$$

$$d. \ (5 + 7) + 6 = \underline{\quad}?$$

DOWN

$$a. \ 100 \div 2 = \underline{\quad}?$$

$$b. \ 345 + 183 = \underline{\quad}?$$

$$c. \ 48 \div 1 = \underline{\quad}?$$

$$d. \ 754 \div 754 = \underline{\quad}?$$

	a.		b.
c.			
	d.		

INQUIRY INTO NUMBER

Another Way To Multiply

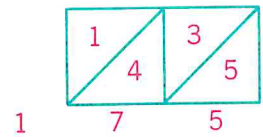
Another way to multiply is the **lattice method**.

- Study the two examples.

Can you see how the lattice method works?

- Try to multiply 9×46 using the *lattice method*. Check your answer using *your method*. If you can not use the *lattice method*, read the following steps.

LATTICE METHOD

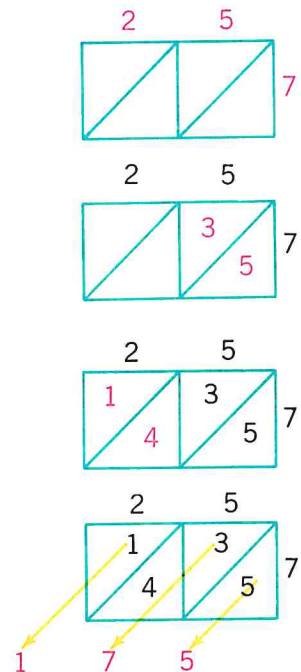


YOUR METHOD

$$\begin{array}{r} 25 \\ \times 7 \\ \hline 175 \end{array}$$

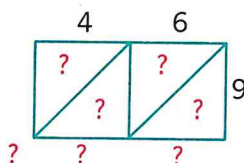
HOW THE LATTICE METHOD WORKS

- Draw the lattice box. Show the factors above and to the right of the box.
- Multiply 7×5 . Write the answer in the first box, tens digit in the top, ones digit in the bottom.
- Multiply 7×2 . Write the answer in the second box, tens digit in the top, ones digit in the bottom.
- Add along the slanting line segments in the box. The arrows are drawn to help you see how to add.



Now try the *lattice method* to find the product of 9 and 46.

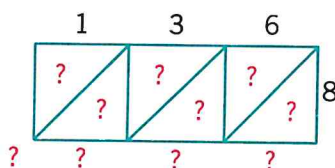
■ Copy and complete the lattice box shown at the right.



Now try the *lattice method* to find the product of 8 and 136.

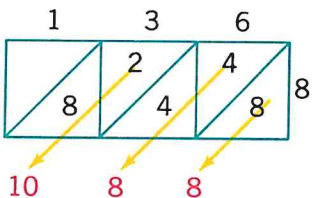
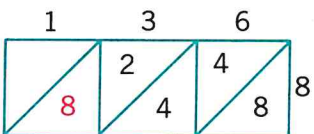
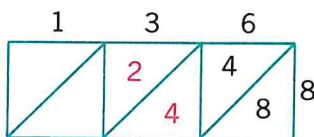
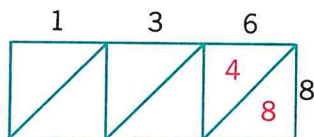
■ Copy and complete the lattice box shown at the right.

If you have difficulty, study the steps below.

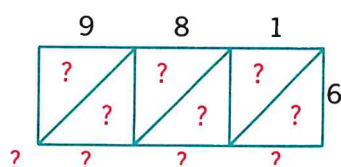
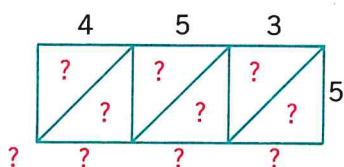
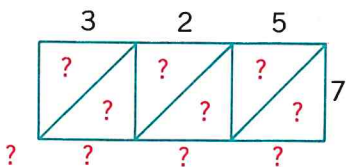


HOW TO MULTIPLY 8 AND 136

- Multiply 8×6 . Write the answer in the first box.
- Multiply 8×3 . Write the answer in the second box.
- Multiply 8×1 . Write the answer in the third box.
- Add along the slanting line segments in the box. Did you get 1088 as your answer?



- Find the following products. Use the *lattice method*.



EXPLORING WITH 7 AS A FACTOR

A. How many facts with factors of 7 do you already know?

$$\begin{array}{ccccccc} 0 \times 7 = \underline{\quad} & 1 \times 7 = \underline{\quad} & 2 \times 7 = \underline{\quad} & & & & \\ 3 \times 7 = \underline{\quad} & 4 \times 7 = \underline{\quad} & 5 \times 7 = \underline{\quad} & 6 \times 7 = \underline{\quad} & & & \end{array}$$

B. You can find the facts you do not know by adding 7 to a fact you already know.

- Since $6 \times 7 = 42$, then $7 \times 7 = 42 + 7$, or $\underline{\quad}$.

C. Sometimes it may be easier to add 7 in parts.

- To add 7 to 49, think:

$$(49 + 1) + \underbrace{6}_{7} = \underline{\quad}$$

- To add 7 to 56, think:

$$(56 + 4) + \underbrace{3}_{7} = \underline{\quad}$$

$$6 \times 7 = 42$$

$$+7$$

$$7 \times 7 = 49$$

$$+7$$

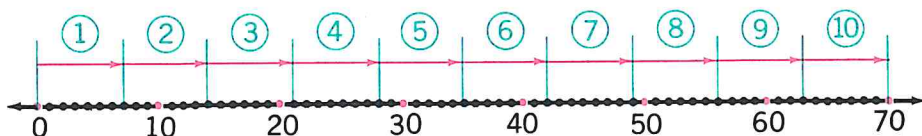
$$8 \times 7 = 56$$

$$+7$$

$$9 \times 7 = 63$$

- Count by sevens.

Begin: "One seven is seven. Two sevens is fourteen."



D. How many 7's are less than 10? between 10 and 20?
between 20 and 30? between 30 and 40? between 40 and 50?
between 50 and 60? greater than 60?

- Are any products also multiples of 10?

EXERCISES

Complete each sentence. If you need help, use the given fact or the number line in **C**.

*1. $5 \times 7 = 35$, so $6 \times 7 = 35 + 7$, or ?

2. $10 \times 7 = 70$, so $9 \times 7 = 70 - 7$, or ?

3. $7 \times 7 = 49$, so $8 \times 7 = 49 + 7$, or ?

4. $2 \times 7 = 14$, so $4 \times 7 = 14 + 14$, or ?

5. $3 \times 7 = 21$, so $6 \times 7 = 21 + 21$, or ?

*6. $6 \times 7 = 42$, so $7 \times 6 = ?$

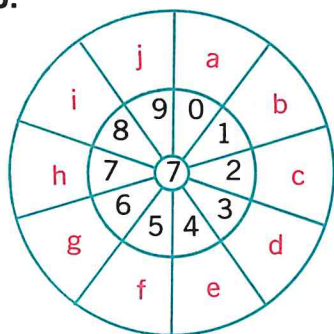
7. $7 \times 4 = 28$, so $4 \times 7 = ?$

8. $5 \times 7 = 35$, so $7 \times 5 = ?$

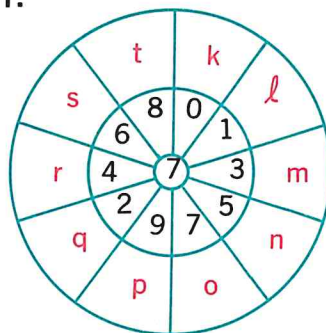
9. $7 \times 8 = 56$, so $8 \times 7 = ?$

Find the products.

10.

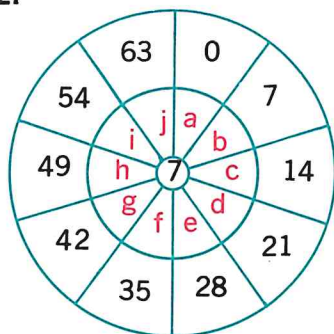


11.

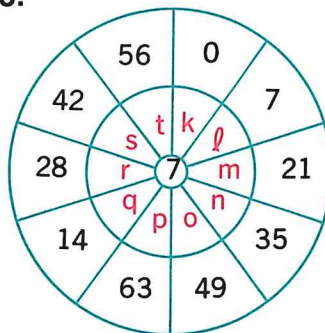


Find the factors.

12.



13.



* 1. 42 6. 42

USING 7 IN MULTIPLICATION

A. Count by 7's to 70.

{7, 14, 21, , , , , , , 70}

B. One week makes how many days?

2 weeks make days.

4 weeks make days.

6 weeks make days.

8 weeks make days.

3 weeks make days.

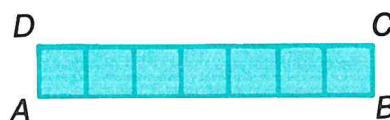
5 weeks make days.

7 weeks make days.

9 weeks make days.

C. How many square units are there in region *URST*?

- How many units would there be in 2 regions like *URST*?
- in 3 regions like *URST*? in 4?
- in 5? in 6? in 7? in 8? in 9?



EXERCISES

Solve each problem. Write a number sentence if it helps you.

- * 1. Mr. Kline is going on a 2-week vacation. How many days will he be away?

2. John spends 3 weeks at summer camp. How many days does he spend at camp?

3. Suppose it is 6 weeks before summer vacation.

How many more days are there before summer vacation?

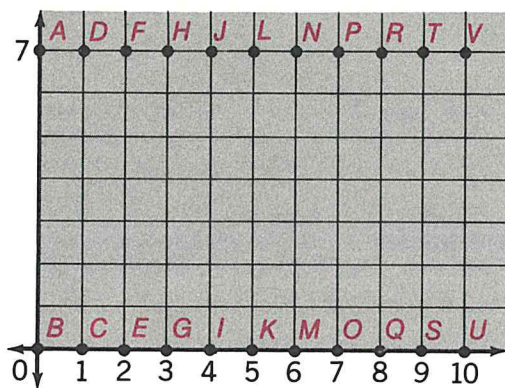
4. Benny saves 4¢ a day. How much can he save in a week?

JULY						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

* 1. $2 \times 7 = 14$; 14

Find each answer.

5. Mary borrowed a book from the library for 1 week.
How many days can she keep the book?
6. Jerry practices the piano for an hour each day of the week. How many hours does he practice in 7 weeks?
in 8 weeks? in 9 weeks?
7. Karen rides the elevator twice a day. How many times does she ride the elevator in a week?



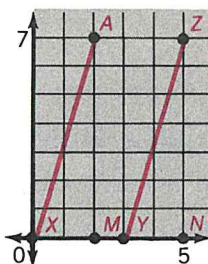
Many rectangular regions are on the grid. With your finger, trace around each region named below. How many square units cover each?

- | | | | |
|----------|----------|----------|----------|
| *8. ABEF | 9. ABGH | 10. ABIJ | 11. ABKL |
| 12. ABMN | 13. ABOP | 14. ABQR | 15. ABST |
| 16. ABUV | 17. HGKL | 18. HGQR | 19. LKST |

Think Twice

How many square units cover each region?

20. AMNZ
21. AXYZ
22. AXM



* 8. 14

EXPLORING WITH 8 AS A FACTOR

A. How many facts with factors of 8 do you already know?

$$0 \times 8 = \underline{\quad ? \quad}$$

$$1 \times 8 = \underline{\quad ? \quad}$$

$$2 \times 8 = \underline{\quad ? \quad}$$

$$3 \times 8 = \underline{\quad ? \quad}$$

$$4 \times 8 = \underline{\quad ? \quad}$$

$$5 \times 8 = \underline{\quad ? \quad}$$

$$6 \times 8 = \underline{\quad ? \quad}$$

$$7 \times 8 = \underline{\quad ? \quad}$$

B. You can find the facts you do not know by adding 8 to a fact you already know.

- Since $7 \times 8 = 56$,
then $8 \times 8 = 56 + 8$, or $\underline{\quad ? \quad}$.

C. Sometimes it may be easier to add 8 in parts.

- To add 8 to 64, think:

$$(64 + \underbrace{6}_{8}) + 2 = \underline{\quad ? \quad}$$

$$7 \times 8 = 56$$

$$+ 8$$

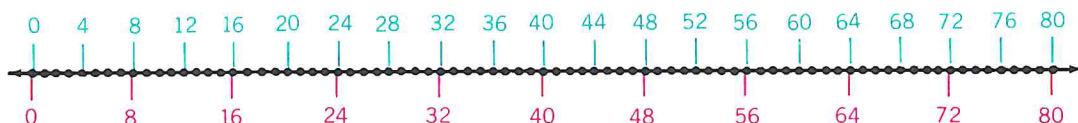
$$8 \times 8 = 64$$

$$+ 8$$

$$9 \times 8 = 72$$

- Count by eights.

Begin: "One eight is eight. Two eights is sixteen."



D. How many 8's are less than 10? between 10 and 20?
between 20 and 30? between 30 and 40? between 40 and 50?
between 50 and 60? between 60 and 70? between 70 and 80?

- Multiples of 4 and multiples of 8 are shown on the number line.

What patterns do you see?

EXERCISES

Complete each sentence. If you need help, use the given fact or the number line in **C**.

*1. $2 \times 8 = 16$, so $4 \times 8 = 16 + 16$, or ?

2. $5 \times 8 = 40$, so $6 \times 8 = 40 + 8$, or ?

3. $5 \times 8 = 40$, so $7 \times 8 = 40 + 16$, or ?

4. $10 \times 8 = 80$, so $9 \times 8 = 80 - 8$, or ?

5. $8 \times 8 = 64$, so $9 \times 8 = 64 + 8$, or ?

*6. $2 \times 8 = 16$, so $3 \times 8 = ?$

7. $4 \times 8 = 32$, so $8 \times 8 = ?$

8. $7 \times 8 = 56$, so $8 \times 7 = ?$

9. $6 \times 8 = 48$, so $8 \times 6 = ?$

10. ? $= 2 \times 8$

11. ? $= 10 \times 8$

12. ? $= 7 \times 8$

13. ? $= 8 \times 6$

14. ? $= 8 \times 7$

15. ? $= 1 \times 8$

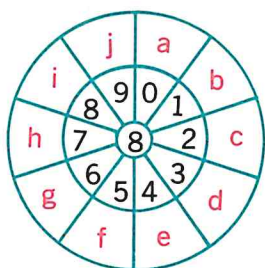
16. ? $= 8 \times 0$

17. ? $= 3 \times 8$

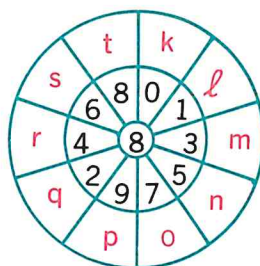
18. ? $= 5 \times 8$

Find the products.

19.

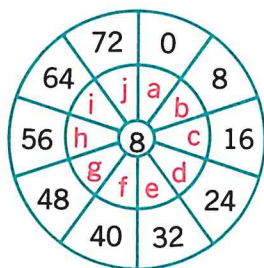


20.

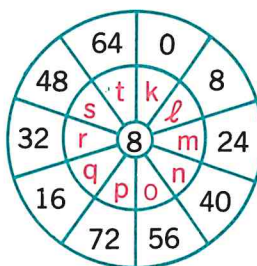


Find the factors.

21.



22.



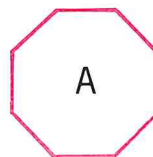
USING 8 IN MULTIPLICATION

A. Count by 8's to 80.

{8, 16, 24, ?, ?, ?, ?, ?, ?, 80}

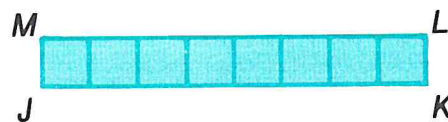
B. How many sides make up figure A?

- How many sides are needed to make 2 figures like A?
- 3 figures? 4 figures?
- 5 figures? 6? 7? 8? 9?



C. How many square units are there in region JKLM?

- How many units would there be in 2 regions like JKLM? in 3? in 4? in 5? in 6? 7? 8? 9?



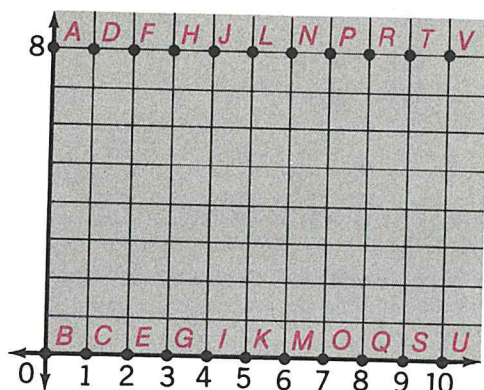
EXERCISES

Find each answer.

1. The planet Neptune rotates on its axis once in 8 hours. How many hours will it take Neptune to rotate 7 times?
2. How many grapefruits are needed to fill 8 bags with 6 grapefruits each?
3. The 8 members of a club sold tickets to their play. Each member sold 5 tickets. How many tickets were sold?
4. Mary's cutout book has 8 pages. Each page has 4 dresses to cut out. How many dresses can she cut out?
5. Alma and Dino are making costumes for the Thanksgiving Day play. How many feathers will they need to make 9 costumes with 8 feathers on each costume?

Find each answer.

6. Each egg costs 8¢. How much will 6 eggs cost?
7. A house has 8 rooms. Each room has 2 windows. How many shades would you need to cover all of the windows?
8. The directions on a can of frozen juice read, "Use 3 cans of water for each can of juice." How many cans of water are needed for 8 cans of juice?



Many rectangular regions are on the grid. With your finger, trace around each region named below. How many square units cover each?

- | | | | |
|----------|----------|----------|----------|
| *9. ABEF | 10. ABGH | 11. ABIJ | 12. ABKL |
| 13. ABMN | 14. ABOP | 15. ABQR | 16. ABST |
| 17. ABUV | 18. HGKL | 19. HGQR | 20. LKST |

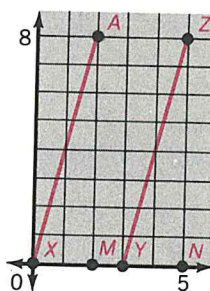
Think Twice

How many square units cover each region?

21. AMNZ

22. AXYZ

23. AXM



* 9. 16

EXPLORING WITH 9 AS A FACTOR

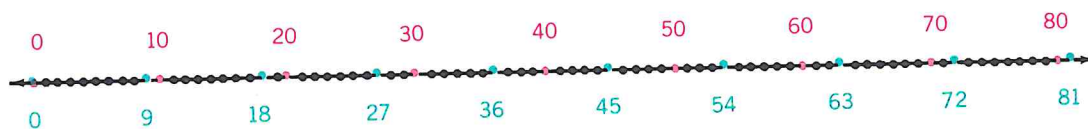
You may know almost all the facts about 9. But sometimes they are hard to remember. Here is one way to think about 9's that may make them easier to remember.

A. Can you subtract each of these numbers from 10?

$10 - 1 = \underline{\quad ? \quad}$	$10 - 2 = \underline{\quad ? \quad}$	$10 - 3 = \underline{\quad ? \quad}$
$10 - 4 = \underline{\quad ? \quad}$	$10 - 5 = \underline{\quad ? \quad}$	$10 - 6 = \underline{\quad ? \quad}$
$10 - 7 = \underline{\quad ? \quad}$	$10 - 8 = \underline{\quad ? \quad}$	$10 - 9 = \underline{\quad ? \quad}$

B. Find the product of 10 and each number below.

2 3 5 4 8 9 6 7 1



C. 9 threes is 10 threes minus 1 three. 10 threes = 30
Put your finger on 30 and back up 3 to get to 9 threes.

■ 9 threes = 30 - 3, or 27

$$9 \times 3 = \underline{\quad ? \quad}$$

■ 9 fours = 10 fours - 1 four

$$\begin{array}{r} 40 \\ - 4 \\ \hline \end{array}$$

✓ Name each product.

$$\begin{array}{l} 9 \text{ fives} = a \\ 9 \times 5 = a \end{array}$$

$$\begin{array}{l} 9 \text{ sevens} = b \\ 9 \times 7 = b \end{array}$$

$$\begin{array}{l} 9 \text{ nines} = m \\ 9 \times 9 = m \end{array}$$

$$\begin{array}{l} 9 \text{ twos} = c \\ 9 \times 2 = c \end{array}$$

$$\begin{array}{l} 9 \text{ sixes} = d \\ 9 \times 6 = d \end{array}$$

$$\begin{array}{l} 9 \text{ eights} = n \\ 9 \times 8 = n \end{array}$$

EXERCISES

Complete this set of multiples of 9.

1. {9, 18, , , , , , , , 90}

Write a multiplication fact for 9 that has a product in the

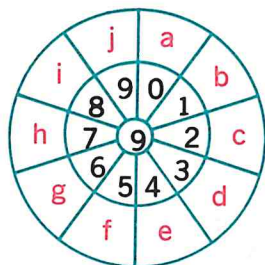
- | | | | |
|----------|----------|----------|----------|
| 2. 20's. | 3. 30's. | 4. 40's. | 5. 50's. |
| 6. 60's. | 7. 70's. | 8. 80's. | |

If you need help, use the number line in C.

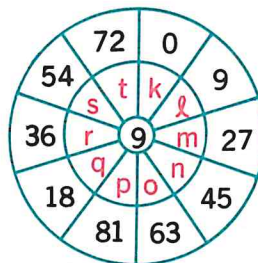
- | | |
|---|----------------------------------|
| 9. 10 sixes = 60, so 9 sixes = <u> </u> | $9 \times 6 = \underline{\quad}$ |
| 10. 10 sevens = 70, so 9 sevens = <u> </u> | $9 \times 7 = \underline{\quad}$ |
| 11. 10 eights = 80, so 9 eights = <u> </u> | $9 \times 8 = \underline{\quad}$ |
| 12. 10 fours = 40, so 9 fours = <u> </u> | $9 \times 4 = \underline{\quad}$ |
| 13. 10 fives = 50, so 9 fives = <u> </u> | $9 \times 5 = \underline{\quad}$ |

Find the products.

14.



15.



Think Twice

Use the set of multiples of 9 shown below to answer each question. Then tell what patterns you see.

{9, 18, 27, 36, 45, 54, 63, 72, 81}

16. Write only the ones digit for these multiples of 9.
 17. Write only the tens digit for these multiples of 9.
 18. Add the tens and ones digits for these multiples of 9.

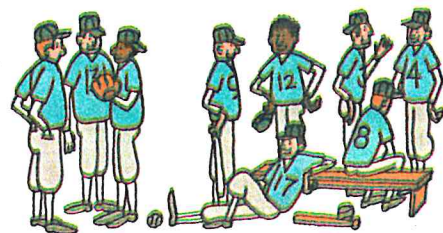
USING 9 IN MULTIPLICATION

A. Count by 9's to 90.

{9, 18, 27, , , , , , , 90}

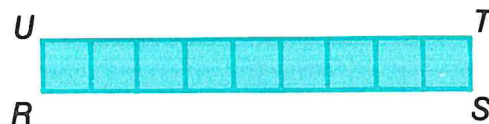
B. How many players are there on this baseball team?

- How many players are there on 2 baseball teams?
- 3 teams? 4 teams?
- 5? 6? 7? 8? 9?



C. How many square units are there in region *RSTU*?

- How many units would there be in 2 regions like *RSTU*?
- in 3? in 4? 5? 6? 7? 8? 9?



EXERCISES

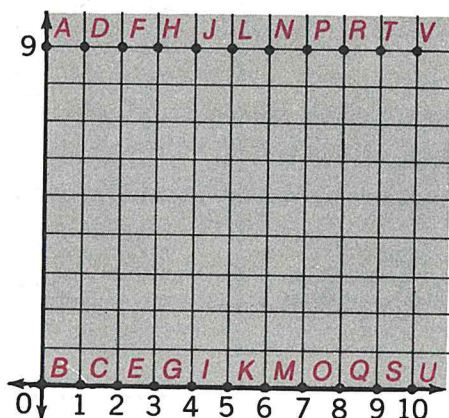
Find the answer.

1. Frank climbs 3 flights of steps to get to his apartment. Each flight has 9 steps. How many steps does he climb?
2. Emma is making hamburgers. She uses 4 ounces of meat for each hamburger. How many ounces of meat will she need for 9 hamburgers?
3. Carl has 9 nickels. How many cents is that?



Find the answer.

4. Gene goes to school 9 months a year. How many months does he go to school in 6 years?
5. There are 9 bunks in a camp. There are 9 beds in a bunk. How many beds are there in the camp?
6. Harry can make 8 ice cream cones from a pint of ice cream. How many cones can he make from 9 pints?



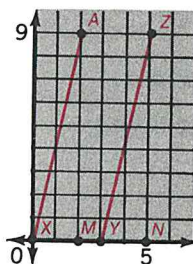
Many rectangular regions are on the grid. With your finger, trace around each region below. How many square units cover each?

- | | | | |
|----------|----------|----------|----------|
| *7. ABEF | 8. ABGH | 9. ABIJ | 10. ABKL |
| 11. ABMN | 12. ABOP | 13. ABQR | 14. ABST |
| 15. ABUV | 16. HGKL | 17. HGQR | 18. LKST |

Think Twice

How many square units cover each region?

19. AMNZ
20. AXYZ
21. AXM



KEEPING UP IN MATHEMATICS

Which is greater? [4]

1. 943 or 887
2. 6×7 or 5×8
3. $64 \div 8$ or $54 \div 6$

Arrange in order from least to greatest. [28-29]

4. {214, 614, 714, 114}
5. {537, 567, 507, 557}
6. {185, 186, 180, 181}
7. {632, 750, 497, 386}
8. {8800, 8000, 8008, 8080}

Solve. [14-15]

9. $n + 8 = 15$
10. $n \times 7 = 35$
11. $n - 7 = 5$
12. $18 \div 9 = n$
13. $45 \div 5 = n$
14. $n \times 6 = 60$
15. $7 \times n = 21$
16. $48 \div 48 = n$

Write the greatest whole number that will make each sentence true. [158]

17. $23 + 8 > \square$
18. $\square < 45 \div 5$
19. $5 \times 6 > \square$
20. $\square < 300 - 258$

Name at least 5 pairs of whole numbers that will make each sentence true. [14-15]

21. $\square + \triangle = 10$
22. $\triangle - \square = 6$
23. $\square \div \triangle = 2$
24. $\square - \triangle = 5$
25. $\triangle - \square = 7$
26. $5 \times \square = \triangle$

Find the answer. [72, 120-22]

$$\begin{array}{r} 27. \quad 246 \\ + 285 \\ \hline \end{array}$$

$$\begin{array}{r} 28. \quad 293 \\ + 508 \\ \hline \end{array}$$

$$\begin{array}{r} 29. \quad \$6.59 \\ + 1.57 \\ \hline \end{array}$$

$$\begin{array}{r} 30. \quad \$8.53 \\ + 4.19 \\ \hline \end{array}$$

$$\begin{array}{r} 31. \quad 488 \\ - 253 \\ \hline \end{array}$$

$$\begin{array}{r} 32. \quad 600 \\ - 314 \\ \hline \end{array}$$

$$\begin{array}{r} 33. \quad \$3.49 \\ - 2.36 \\ \hline \end{array}$$

$$\begin{array}{r} 34. \quad \$15.53 \\ - 9.86 \\ \hline \end{array}$$

Use the given fact to complete each sentence. [142-144]

35. $8 \times 3 = 24$,
so $24 \div 3 = \underline{\quad ? \quad}$
36. $4 \times 9 = 36$,
so $36 \div 9 = \underline{\quad ? \quad}$
37. $6 \times 7 = 42$,
so $42 \div 6 = \underline{\quad ? \quad}$

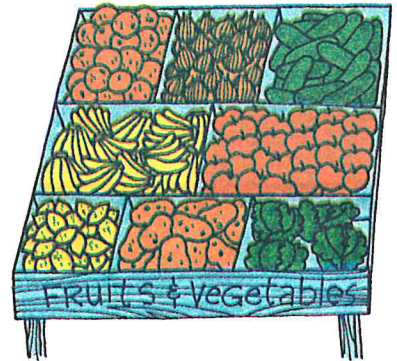
TRY AN EASIER PROBLEM FIRST

A. Try this problem. If you cannot do it, try the problem in **B**.

- A pound of fruit costs 32¢.
Find the cost of 3 pounds?

B. An apple costs 9¢.
How much will 3 apples cost?

- Do you multiply or divide to find the answer?
 $3 \times 9 = \underline{\quad}$
So three apples costs $\underline{\quad}$ ¢.
- Go back and do the problem in **A**.



EXERCISES

If you have trouble with the problem in column **A**, do the problem in column **B**. Then go back and try the problem in column **A** again.

A

1. How much are 7 heads of lettuce at 32¢ each?
2. The cost of 8 pounds of potatoes is \$.72. How much is a pound of potatoes?
3. Oranges come 36 to a crate. How many oranges are there in 9 crates?
4. There are 8 lemons in a bag. How many bags do you need for 168 lemons?

B

1. 4 onions.
7¢ each.
All the onions cost $\underline{\quad}$ ¢.
2. 2 cucumbers.
26¢ for both.
 $\underline{\quad}$ ¢ for each.
3. 4 rows of melons.
5 melons in each row.
 $\underline{\quad}$ melons altogether.
4. 5 apples per pie.
45 apples.
 $\underline{\quad}$ pies.

If you have trouble with the problem in column **A**, do the problem in column **B**. Then go back and try the problem in column **A** again.

A

B

- | | |
|---|---|
| 5. Sal took 36 pictures with his camera. Each flash cube he used took 4 pictures. How many cubes did he use? | 5. 12 squares.
4 in each row.
<u> </u> rows. |
| 6. Barbara has a yard of ribbon. How many 3-inch book marks can she make? | 6. 4 quarts in a gallon.
20 quarts.
<u> </u> gallons. |
| 7. Patty bought 6 pairs of socks. They cost 98¢ a pair. How much did she spend in all? | 7. 9 pencils.
5¢ each.
<u> </u> ¢ altogether. |
| 8. The custodians set up 150 chairs. They put them in 5 rows. Each row has the same number of chairs. How many are in each row? | 8. 54 marbles.
6 colors.
<u> </u> of each color. |
| 9. A teacher checks 4 papers a day from each pupil. She has 32 pupils. How many papers does she check each day? | 9. 7 boxes of chalk.
5 pieces in each box.
<u> </u> pieces in all. |
| 10. A package of 4 sticks of butter costs 80¢. How much will 1 stick cost? | 10. 36 feet of rope.
9 jump ropes.
<u> </u> feet per jump rope. |
| 11. A record costs 98¢. How much will 7 records cost at this same price? | 11. 2 sneakers in a pair.
10 pairs.
<u> </u> sneakers in all. |

CHECKPOINT

✓ Check your understanding of **key ideas**.

1a. Complete each sentence.

$$8 = (\underline{\quad} + 6)$$

$$48 + 8 = \underline{\quad}$$

1b. Why is it sometimes easier to add a number in parts?

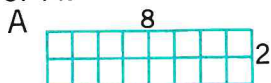
2a. Complete each sentence.

$$10 \text{ sevens} = \underline{\quad}$$

$$9 \text{ sevens} = \underline{\quad}$$

2b. How does knowing the multiples of ten help you to learn facts about 9?

3a. How many square units cover A?



3b. How can you use multiplication to find the number of units that cover a figure?

4a. Find the product. Is it *Odd* or *Even*?

$$7 \times 5 = \underline{\quad}$$

$$9 \times 9 = \underline{\quad}$$

$$8 \times 6 = \underline{\quad}$$

4b. What is true about the product when both factors are odd? when either factor is even?

✓ Check your **skills**.

Find the product.

$$\begin{array}{r} 1. \quad 8 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 5 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 6 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 4 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 7 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 6 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 9 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 4 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 7 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 3 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 8 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 9 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 5 \\ \times 9 \\ \hline \end{array}$$

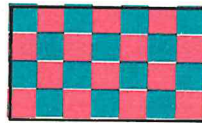
$$\begin{array}{r} 14. \quad 7 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 8 \\ \times 8 \\ \hline \end{array}$$

UNIT TEST

Find the answers.

1. Write two multiplication sentences and two division sentences for this number family. $\{8, 9, 72\}$
2. Ron bought 7 post cards. They cost 8¢ each. How much did all the post cards cost?
3. Sarah spent 3 weeks with her grandmother. How many days was that?
4. A bookcase has 6 shelves. There are 9 books on each shelf. How many books in all?
5. How many square units cover this game board?



Find the products.

$$\begin{array}{r} 6. \quad 9 \\ \times 0 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 9 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 8 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 9 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 7 \\ \times 8 \\ \hline \end{array}$$

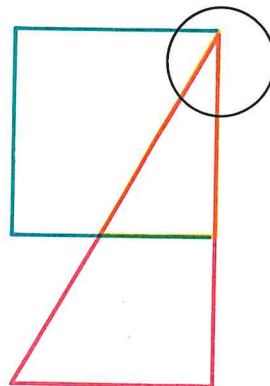
If you have time, try these.

11. Which names the greater number, 8×27 or 8×30 ?
12. Which is less, $210 \div 7$ or $280 \div 7$?

MATHAMUSEMENTS

There is an invisible rabbit on this pattern. Find the color of the place he sits on. Use these questions and his answers.

- "Are you on a side of a triangle?" "Yes."
- "Are you on a side of a square?" "Yes."
- "Does the circle touch the line segment you are on?" "No."



INQUIRY INTO NUMBER

Number Sequences



The flowers above are arranged in a special order. They are in a **sequence**.

- Can you tell the pattern used to draw these flowers? Try to draw the next flower.

The numbers below are in a sequence.

2, 4, 6, 8, ?, ?, ?

- Guess what are the next three numbers after 8.
- Which rule could you use to find each missing number in the sequence?

Add 1. Add 2. Add 3.

In the sequence below, is each number less than the one shown before it? How much less?

49, 44, 39, 34, ?, ?, ?, ?

- What is the rule used in this sequence?
- What are the next four numbers in the sequence?

In the sequence below, what has been subtracted from the first number to get the second number? What has been added to the second number to get the third?

7, 4, 8, 5, 9, ?, ?, ?, ?

- Does this pattern continue?
- Name the next four numbers in the sequence.

Find the pattern in each sequence. Use the pattern to name the next four numbers in the sequence.

1, 4, 7, 10, ?, ?, ?, ?
56, 51, 46, 41, ?, ?, ?, ?
2, 4, 7, 11, ?, ?, ?, ?
8, 12, 10, 14, 12, ?, ?, ?, ?
1, 2, 4, 7, 11, 16, ?, ?, ?, ?

Look for a pattern to use to name the next three numbers.

2, 6, 18, 54, ?, ?, ?

- Is each number greater than the one before it?
How much greater?
- What can you add to each number to get the next number?
- What is the rule? Can you find another rule?
- What number times 2 gives you 6?
What number times 6 gives you 18?
If you multiply 18 by 3, do you get 54?
What is the rule?
- Name the next three numbers in the sequence.

Find the pattern in each sequence.

Use the pattern to name the next three numbers.

5, 15, 45, 135, ?, ?, ?
128, 64, 32, ?, ?, ?
3, 9, 27, 81, ?, ?, ?
320, 160, 80, ?, ?, ?
6, 60, 600, ?, ?, ?

These patterns are a little harder to discover. See if you can find the pattern. Use it to name the next four numbers in the sequence.

4, 2, 8, 4, 16, 8, ?, ?, ?, ?
2, 12, 4, 24, 8, 48, ?, ?, ?, ?

GLOSSARY

Some terms and phrases that you will want to remember are described below. To find where these are used in the book, look in the index, which begins on page 375.

Addition. The operation of *addition* combines two numbers, called addends, with a third number, called a sum.

$$6 + 4 = 10$$

addend + addend = sum

Associative property. The way addends or factors are grouped does not change the sum or product.

This is the *associative property of addition*.

$$(4 + 3) + 5 = 4 + (3 + 5)$$

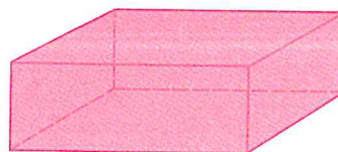
This is the *associative property of multiplication*.

$$(2 \times 3) \times 7 = 2 \times (3 \times 7)$$

Closed surface. A *closed surface* is a set of points that encloses a part of space and has no holes in it.



sphere



rectangular closed surface

Commutative property. Changing the order of addends or factors does not change the sum or product.

This is the *commutative property of addition*.

$$6 + 8 = 8 + 6$$

This is the *commutative property of multiplication*.

$$5 \times 7 = 7 \times 5$$

Congruent. Two geometric figures that have exactly the same size and shape are *congruent*.



Counting number. A *counting number* is any number that is a member of this set $\{1, 2, 3, 4, \dots\}$. For example, 10 and 49 are counting numbers, but 0 and $\frac{1}{2}$ are not.

Distributive property. To find the product of a number and the sum of two numbers it makes no difference whether you add and then multiply or multiply and then add. This is the *distributive property of multiplication over addition*. $2 \times (3 + 5) = (2 \times 3) + (2 \times 5)$

Division. *Division* is the operation of finding a factor when a product and one factor are known. You use division to find quotients and remainders.

$$\begin{array}{r} \text{quotient} \\ 3 \text{ r}1 \leftarrow \text{remainder} \\ 8 \overline{)25} \leftarrow \text{dividend} \\ \uparrow \text{divisor} \end{array}$$

Empty set. The *empty set* is the set that has no members. The symbol for the empty set is $\{ \}$.

Equivalent sets. Sets whose members can be matched one-to-one are *equivalent sets*.

Even number. An *even number* is any number that is a member of this set $\{0, 2, 4, 6, 8, \dots\}$. For example, 16 and 32 are even numbers, but 23 and 45 are not.

Fraction. A *fraction* is a name for a fractional number in the form $\frac{a}{b}$. For example, $\frac{3}{4}$ is a fraction.

Fractional number. A *fractional number* tells “what part.” For example, $\frac{2}{3}$ tells what part of the region is blue.



Line. A *line* is a straight path that goes on and on in both directions without end.



Line segment. A *line segment* is a straight path from one point to another point.



Line of symmetry. A *line of symmetry* separates a plane figure into two parts so that one part is a reflection of the other.



Multiple. A *multiple* of any counting number is formed by multiplying that number by any whole number. Multiples of 4 are $\{0, 4, 8, 12, \dots\}$.

Multiplication. The operation of *multiplication* relates two numbers, called factors, with a third number, called the product.

$$4 \times 2 = 8$$

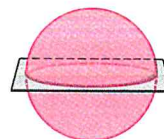
factor \times *factor* = *product*

Odd number. An *odd number* is any number that is a member of this set $\{1, 3, 5, 7, 9, \dots\}$. For example, 17 and 83 are odd numbers, but 22 and 96 are not.

Ordered pair. An *ordered pair* of numbers is a pair of numbers in a certain order. The ordered pair (2, 3) is not the same as the ordered pair (3, 2).

Plane. A *plane* is the set of all points in a flat surface that goes on and on in all directions without end.

Plane of symmetry. A *plane of symmetry* separates a closed surface into two parts so that one part is a reflection of the other.



Set. A *set* is a collection of things.

Simple closed path. A *simple closed path* is a set of points in a plane that begins and ends at the same point but does not cross itself.



ellipse



circle



triangle



square



rectangle

Subset. A *subset* is a part of a set.

Subtraction. *Subtraction* is the operation of finding an addend when a sum and one addend are known.

Whole number. A *whole number* is any number that is a member of this set $\{0, 1, 2, 3, \dots\}$. For example, 13 and 60 are whole numbers, but $\frac{1}{4}$ is not.

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THE

END

